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PATENT AND TRADEMARK OFFICE NOTICES

Priority Claims Based on Inventors' Certificates

Pursuant to the provisions of 35 U.S.C. 119, last paragraph (as amended July 28, 1972), 37 CFR 1.55(c) requires that when an applicant wishes to claim a right of priority on the basis of an application for an inventor's certificate, ". . . the applicant or his attorney or agent, when submitting a claim for such right . . . shall include an affidavit or declaration including a specific statement that, upon an investigation, he has satisfied himself that to the best of his knowledge the applicant, when filing his application for the inventor's certificate, had the option to file an application either for a patent or for an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority."

As such, it has been and remains the position of the Patent and Trademark Office that, in accordance with 35 U.S.C. 119, applications for inventors' certificates shall give rise to a right of priority only when the country in which they are filed gives to applicants, at their discretion, the right to apply, on the same invention, either for a patent or for an inventor's certificate. The affidavit or declaration specified under 37 CFR 1.55(c) is only required for the purpose of ascertaining whether, in the country where the application for an inventor's certificate originated, this option generally existed for applicants with respect to the particular subject matter of the invention involved. The requirements of 35 U.S.C. 119 and 37 CFR 1.55(c) are not intended, however, to probe into the eligibility of the particular applicant to exercise the option in the particular priority application involved.

It is recognized that certain countries that grant inventors' certificates also provide by law that their own nationals who are employed in state enterprises may only receive inventors' certificates and not patents on inventions made in connection with their employment. This will not impair their right to be granted priority in the United States based on the filing of the inventor's certificate.

Accordingly, affidavits or declarations filed pursuant to 37 CFR 1.55(c) need only show that in the country in which the original inventor's certificate was filed, applicants generally have the right to apply at their own option either for a patent or an inventor's certificate as to the particular subject matter of the invention.

C. MARSHALL DANN,
Aug. 17, 1977. *Commissioner of Patents and Trademarks.*

Requirements for Priority Documents, Priority Based on Application for Industrial Design

In the Federal Republic of Germany, an application for protection of an industrial design may be accompanied by either a model or a drawing. It is understood that German residents file such applications with their local judicial authority ("Amtsgericht") rather than with the German Patent Office in Munich.

Questions have been raised in this connection as to:

(1) What sort of priority document under 35 U.S.C. 119 is required when the original filing has comprised a model rather than a drawing, and

(2) Whether it is necessary where the original filing was with a local judicial authority to obtain also a certificate from the national patent office.

As to the first question, the Patent and Trademark Office will receive under 35 U.S.C. 119, as evidence of an earlier filed design application which included the deposit of a model, drawings or acceptable photographs of the deposited model faithfully reproducing the design embodied therein together with other required information, certified by an official of the court or office with which the application was originally filed.

No additional certification by the national patent office will be required. Article 4D(3) of the Paris Convention refers to certification ". . . by the authority which received such application . . ." so the reference in 35 U.S.C. 119 to "patent office" will be construed to extend also to the authority in charge of the design register.

Aug. 15, 1977. C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 244,495, Re. S.N. 816,098, Filed July 15, 1977, Cl. D6/01, CHAIR OR SIMILAR ARTICLE, Warren D. Petersen, Owner of Record: *Burd, Inc., Howell Division, Saint Charles, Ill.,* Attorney or Agent: Benjamin H. Sherman, et al., Ex. Gp.: 290

3,552,120, Re. S.N. 806,312, Filed June 13, 1977, Cl. 60/525, STIRLING CYCLE TYPE THERMAL DEVICE, William T. Beale, Owner of Record: *Research Corporation, New York, N.Y.,* Attorney or Agent: Harold L. Stowell, Ex. Gp.: 341

3,639,659, Re. S.N. 820,417, Filed Aug. 1, 1977, Cl. 260/78 L, CONTINUOUS EXTRACTION OF GRANULAR POLYAMIDES, Werner Nieswandt, et al., Owner of Record: *Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany,* Attorney or Agent: Herbert B. Keil, et al., Ex. Gp.: 143

3,839,428, Re. S.N. 818,346, Filed July 22, 1977, Cl. 260/514 R, PROCESS FOR PREPARATION OF ORGANIC CARBOXYLIC ACIDS, Nobuo Isogai, Owner of Record: *Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan,* Attorney or Agent: John E. Lind, et al., Ex. Gp.: 127

3,893,775, Re. S.N. 817,654, Filed July 21, 1977, Cl. 403/225, RESILIENT BUSHING WITH LONG FATIGUE LIFE, David L. Sievers, et al., Owner of Record: *The General Tire & Rubber Company, Akron, Ohio,* Attorney or Agent: Frank C. Rote, Jr., et al., Ex. Gp.: 353

3,895,753, Re. S.N. 817,944, Filed July 22, 1977, Cl. 227/67, FASTENER ATTACHMENT SYSTEM NEEDLE CONSTRUCTIONS, Arnold R. Bone, Owner of Record: *Dennison Manufacturing Company, Framingham, Mass.,* Attorney or Agent: George E. Kersey, Ex. Gp.: 325

3,895,888, Re. S.N. 817,177, Filed July 20, 1977, Cl. 418/61 B, HYDROSTATIC CONTROL UNIT, Maurice Paul Roberts, Owner of Record: *TRW Inc., Cleveland, Ohio,* Attorney or Agent: J. Herman Yount, Jr., et al., Ex. Gp.: 343

3,896,150, Re. S.N. 817,164, Filed July 20, 1977, Cl. 260/340.7, 2,6,10-TRIMETHYLDODECA-2,6,11-TRIEN-10-OL-1 AL,2,6-DIMETHYL-2,6-UNDECADIEN-10-ON-1-AL AND THEIR ACETALS AND PROCESSES FOR THEIR PRODUCTION, Werner Hoffmann, Owner of Record: *Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany,* Attorney or Agent: Herbert B. Keil, et al., Ex. Gp.: 124

3,922,441, Re. S.N. 818,407, Filed July 25, 1977, Cl. 428/446, LITHOGRAPHIC PRINTING PLATE AND METHOD OF MAKING THE SAME, Michael J. Shaw, Owner of Record: *Allied Paper Incorporated, Kalamazoo, Mich.,* Attorney or Agent: Richard H. Thomas, et al., Ex. Gp.: 164

3,924,131, Re. S.N. 819,629, Filed July 27, 1977, Cl. 250/360, METHOD OF AND APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION, Godfrey Newbold Hounsfield, Owner of Record: *EMI Limited, Hayes, Middlesex, England,* Attorney or Agent: Ivan S. Kavrokov, et al., Ex. Gp.: 256

3,937,865, Re. S.N. 818,058, Filed July 22, 1977, Cl. 428/413, REINFORCED PLASTICS CARRIER FOR PRINTED CIRCUITS, Hendrik Jongetjes, Owner of Record: *Koninklijke Papierfabrieken Van Gelder Zonen N.V., Amsterdam, Netherlands,* Attorney or Agent: Charles E. Brown, et al., Ex. Gp.: 164

3,959,310, Re. S.N. 817,868, Filed July 20, 1977, Cl. 260/326.9, CATIONIC DYESTUFFS, Alfred Brack, Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Allan R. Plumley, et al., Ex. Gp.: 122

3,977,119, Re. S.N. 800,002, Filed May 24, 1977, Cl. 46/12, COLLAPSIBLE PLAYHOUSE MADE FOR TWO EQUAL PARTS, Donald C. Nelson, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 333

3,994,305, Re. S.N. 820,359, Filed July 29, 1977, Cl. 131/7, SELF-LIGHTING CIGARETTE HAVING A PROTECTIVE CAP, Lloyd M. Hughes, Owner of Record: *Lloyd M. Hughes Enterprises, Inc., Chicago, Ill.,* Attorney or Agent: James P. Hume, et al., Ex. Gp.: 335

3,997,817, Re. S.N. 817,974, Filed July 22, 1977, Cl. 361/213, DEVICE FOR NEUTRALIZING THE CHARGE ON STATICALLY-CHARGED SURFACES, Philip Edward Secker, Owner of Record: *Inventor,* Attorney or Agent: Jack C. Berenzweig, et al., Ex. Gp.: 212

4,015,383, Re. S.N. 818,244, Filed July 22, 1977, Cl. 52/224, CONCRETE TANK OF PRECAST CONCRETE PANELS WITH PRETENSIONING BEAM MEANS, Francis X. Crowley, Owner of Record: *Inventor,* Attorney or Agent: William W. Rymer, Ex. Gp.: 354

4,026,272, Re. S.N. 820,583, Filed Aug. 1, 1977, Cl. 126/271, SOLAR COLLECTOR, Edward W. Bottum, Owner of Record: *Inventor,* Attorney or Agent: Edward A. Craig, Ex. Gp.: 344

PATENT NOTICES

Certificates of Correction for the Week of Sept. 20, 1977

Re. 29,133	4,014,728	4,026,458	4,030,790
3,448,088	4,014,879	4,026,767	4,030,827
3,637,809	4,015,045	4,026,773	4,031,086
3,697,585	4,015,163	4,026,839	4,031,093
3,738,377	4,015,402	4,027,016	4,031,148
3,758,008	4,015,464	4,027,042	4,031,175
3,839,484	4,015,511	4,027,213	4,031,176
3,921,091	4,015,953	4,027,270	4,031,183
3,944,527	4,016,219	4,027,401	4,031,260
3,944,812	4,016,520	4,027,446	4,031,325
3,946,265	4,016,639	4,027,521	4,031,382
3,956,202	4,016,811	4,027,624	4,031,386
3,956,686	4,016,958	4,027,628	4,031,405
3,958,677	4,017,476	4,027,780	4,031,574
3,963,548	4,017,694	4,027,809	4,031,608
3,969,703	4,018,162	4,027,867	4,031,678
3,987,949	4,018,771	4,027,990	4,031,731
3,990,184	4,019,548	4,028,133	4,031,770
3,990,362	4,019,657	4,028,282	4,031,815
3,991,585	4,019,725	4,028,295	4,031,922
3,991,705	4,020,068	4,028,324	4,031,970
3,993,814	4,020,458	4,028,396	4,032,019
3,995,061	4,020,876	4,028,422	4,032,046
3,996,263	4,021,191	4,028,460	4,032,091
3,996,412	4,021,224	4,028,507	4,032,094
3,996,562	4,021,437	4,028,528	4,032,109
3,998,743	4,021,667	4,028,595	4,032,119
4,000,986	4,022,099	4,028,596	4,032,136
4,001,044	4,022,116	4,028,611	4,032,141
4,001,656	4,022,180	4,028,637	4,032,207
4,002,536	4,022,247	4,029,110	4,032,284
4,003,998	4,022,473	4,029,441	4,032,428
4,004,725	4,022,684	4,029,454	4,032,493
4,005,035	4,022,958	4,029,539	4,032,582
4,005,049	4,022,995	4,029,549	4,032,591
4,006,063	4,023,435	4,029,568	4,032,616
4,006,395	4,023,444	4,029,632	4,032,653
4,007,813	4,023,489	4,029,675	4,032,765
4,009,163	4,023,504	4,029,716	4,032,769
4,009,198	4,023,795	4,029,789	4,032,830
4,009,801	4,023,955	4,029,813	4,032,893
4,010,151	4,024,462	4,029,942	4,032,984
4,010,993	4,025,063	4,030,024	4,033,369
4,011,886	4,025,067	4,030,121	4,033,687
4,011,922	4,025,291	4,030,131	4,033,714
4,012,166	4,025,354	4,030,160	4,033,976
4,013,539	4,025,360	4,030,199	4,033,984
4,013,790	4,025,382	4,030,390	4,034,026
4,014,096	4,025,458	4,030,456	4,034,149
4,014,135	4,025,598	4,030,541	4,034,177
4,014,433	4,025,643	4,030,662	4,034,388
4,014,454	4,025,813	4,030,671	4,034,878
4,014,568	4,026,428	4,030,756	

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,576,540, D. G. Fair, H. L. Beaverstad and C. F. Erikson, PLURAL MACHINE TOOL AND PART HANDLING CONTROL SYSTEM, Interference No. 98,192, decided Apr. 4, 1977, claims 2 and 7.

Patent No. 3,576,540, D. G. Fair, H. L. Beaverstad and C. F. Erikson, PLURAL MACHINE TOOL AND PART HANDLING CONTROL SYSTEM, Interference No. 98,193, decided Apr. 4, 1977, claims 6, 11, 12, 15 and 16.

Patent No. 3,700,706, S. A. Butter, SELECTIVE CARBONYLATION OF OLEFINICALLY UNSATURATED HYDROCARBONS USING PALLADIUMPHOSPHINE CATALYSTS PROMOTED WITH TIN SALTS, Interference No. 98,353, decided Feb. 11, 1976, claims 1, 2, 3, 4, 6, 7, 8 and 9.

Patent No. 3,702,441, K. R. Thrower, FREQUENCY SYNTHESIZING SYSTEM, Interference No. 98,445, decided July 25, 1977, claims 1, 2, 3, 4, 5 and 6.

Patent No. 3,705,131, V. V. Korshak, M. E. Volpin, V. A. Sergeev, V. K. Shitikov and I.S. Kolomnikov, POLYMERS OF POLYPHENYLENE TYPE AND METHOD OF PRODUCING THE SAME, Interference No. 98,756, decided June 16, 1977, claims 1, 2, 5, 6, 7 and 8.

Patent No. 3,814,970, J. P. Reboul, GAS-DISCHARGE DISPLAY PANELS, Interference No. 99,468, decided May 11, 1977, claims 1, 2, 3 and 4.

Patent No. 3,825,583, A. A. Hussain and J. E. Truelove, ESTER OF 3-HYDROXY-α-[(METHYLAMINO)METHYL] BENZYL ALCOHOL, Interference No. 98,929, decided May 24, 1977, claims 1 and 2.

Patent No. 3,834,672, R. T. Hawley and R. S. Hollyer, DRILL STRING HEAVE COMPENSATOR AND LATCHING APPARATUS, Interfernece No. 99,427, decided May 10, 1977, claim 1.

Patent No. 3,838,635, A. L. Hardy, COMPACTOR WITH RAM MEANS HAVING AN AUTOMATICALLY MOVABLE RAM HEAD, Interference No. 98,968, decided Feb. 28, 1977, claims 1, 2, 4, 5 and 6.

Patent No. 3,839,017, E. G. Schempp, APPARATUS AND METHOD FOR CONVERTING IMPURE FERROUS METAL TO STEEL, Interference No. 99,282, decided June 16, 1977, claims 1, 2, 4, 5, 7 and 8.

Patent No. 3,855,947, J. M. Henley and E. C. Thordsen, BASE CONSTRUCTION HAVING SELF-LEVELLING CAPABILITY, Interference No. 99,056, decided Mar. 28, 1977, claims 1, 2 and 3.

Patent No. 3,876,821, J. P. Pringle, INJECTION MOLDED ELECTRICAL BOX, Interference No. 99,485, decided May 19, 1977, claim 1.

Patent No. 3,886,251, H. Sekiguchi and K. Sadamitsu, METHOD FOR FORMING POLYOXADIAZOLE SERIES RESIN SOLUTION INTO SHAPED ARTICLES, Interference No. 99,472, decided May 17, 1977, claim 1.

Patent No. 3,891,032, G. H. Tausch and R. E. Pringle, APPARATUS FOR INSTALLING AND REMOVING FLOW CONTROL DEVICES, Interference No. 99,475, decided June 23, 1977, claims 1, 4, 5, 6 and 7.

Patent No. 3,903,890, F. K. Mesek and V. L. Repke, DISPOSABLE DIAPER OF SIMPLE CONSTRUCTION, Interference No. 99,302, decided June 29, 1977, claims 1, 4, 5, 6, 7, 8, 9, 11, 13 and 14.

Patent No. 3,904,634, G. Arcari, L. Bernardi, A. Glasser and B. Patelli, BROMOERGOLINES AND PROCESS FOR PREPARING THE SAME, Interference No. 99,385, decided June 14, 1977, claims 3, 4 and 11.

Patent No. 3,912,964, M. Kouyama, K. Nakada, T. Odaka, and Akio Miyamoto, MULTI-DIGIT DISPLAY APPARATUS, Interference No. 99,374, decided May 25, 1977, claim 1.

Patent No. 3,914,022, R. A. Kashnow, QUASI-HOMEOTROPIC TWISTED NEMATIC LIQUID CRYSTAL DEVICE, Interference No. 99,389, decided June 16, 1977, claims 1, 2, 3 and 6.

Disclaimers

3,396,920.—*Harold A. Rosen*, Santa Monica, and *Donald D. Williams*, Inglewood, Calif. APPARATUS FOR CHANGING THE ORIENTATION AND VELOCITY OF A SPINNING BODY TRAVERSING A PATH. Patent dated Aug. 13, 1968. Disclaimer filed Apr. 19, 1977, by the assignee, *National Aeronautics and Space Administration*.

Hereby enters this disclaimer to all claims of said patent.

3,954,177.—*Clifford C. Faust,* Riverside, Ill. CONTAINER PACKAGE HAVING INTEGRAL MEANS FOR CARRYING. Patent dated May 4, 1976. Disclaimer filed Aug. 3, 1977, by the assignee, *Union Carbide Corporation.*

The term of this patent subsequent to Apr. 6, 1993 has been disclaimed.

3,998,087.—*John P. Schumacher* and *William F. Hollenbeck,* Louisville, Ohio. PRESS SLIDE WITH EXTENDABLE AND RETRACTABLE TOOL SUPPORT. Patent dated Dec. 21, 1976. Disclaimer filed Aug. 5, 1977, by the assignee, *Gulf & Western Manufacturing Company.*

Hereby enters this disclaimer to claim 11 of said patent.

4,041,689.—*Patrick Joseph Duncan,* Hendersonville, Tenn. and *Francis Edward Scrivener, Jr.,* Chester, Va. MULTILOBAL POLYSTER YARN. Patent dated Aug. 16, 1977. Disclaimer filed Aug. 1, 1977, by the assignee, *E. I. du Pont de Nemours and Company.*

The term of this patent subsequent to Sept. 19, 1989 has been disclaimed.

Disclaimer and Dedication

3,885,174.—*George A. Schoenfelder,* Naperville, Ill. X-T FLEXTURE PIEZOELECTRIC DEVICE. Patent dated May 20, 1975. Disclaimer and dedication filed Aug. 8, 1977, by the assignee, *Motorola, Inc.*

Hereby enters this disclaimer and dedicates to the Public claims 1, 2, 3, 4, 5 and 6 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 2, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-23-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Sterolds; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-3-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-19-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition: Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-12-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-14-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-29-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	4-14-70
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during July 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,943,327 to 2,947,000, inclusive
Plant Patents..... Numbers 1,957 to 1,962, inclusive

REISSUES

SEPTEMBER 20, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,402

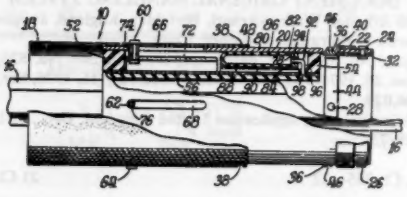
VIBRATION ISOLATING GRIP FOR PNEUMATIC HAND TOOLS

Daniel Bronson Shotwell, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Original No. 3,916,478, dated Nov. 4, 1975, Ser. No. 470,203, May 15, 1974. Application for reissue Sept. 20, 1976, Ser. No. 724,435

Int. Cl.[2] **A47J** *45/08;* **B25G** *1/12*

U.S. Cl. 16—116 R **23 Claims**



2. [The combination of claim **1** in which] *A vibration isolating and heat insulating hand grip for a power driven, manually manipulated impact tool which has a shank that mounts in a chuck, said grip comprising, in combination:*

a rigid, tubular shell of non-porous material which is adapted to surround a tool shank and is open at both ends;

a compliant, non-porous sleeve within said shell, said sleeve being open at both ends and being large enough that a tool shank extends loosely therethrough, said sleeve having only its end portions blended to the end portions of the shell, and said shell and sleeve defining an inflatable annular chamber;

a cylindrical vibration damping and heat insulating housing surrounding the shell, the dimensions of said housing being such that it may be readily gripped by a human hand;

means operatively associated with said shell for inflating said chamber so the compliant sleeve firmly grips the tool shank, and for deflating said chamber to release said compliant sleeve from the tool shank; and

the means for inflating and deflating the annular chamber [comprises] *comprising* a deformable bladder in the housing, a passage connecting the bladder with the annular chamber, and manually operable means for manipulating the bladder to move fluid back and forth between the bladder and the chamber.

Re. 29,403

QUARTZ CRYSTAL WRIST WATCH

Satoshi Yamazaki, Owa Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

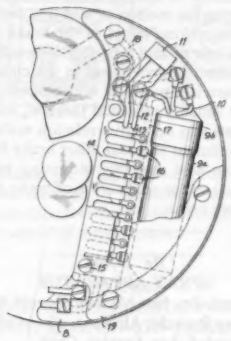
Original No. 3,902,312, dated Sept. 2, 1975, Ser. No. 457,009, Apr. 1, 1974. Continuation-in-part of Ser. No. 166,501, July 27, 1971, Pat. No. 3,800,523. Application for reissue Aug. 3, 1976, Ser. No. 711,176

Claims priority, application Japan, July 27, 1970, 45-65035; Sept. 10, 1970, 45-78803

Int. Cl.[2] **G04C** *3/00;* **G04B** *29/02*

U.S. Cl. 58—23 D **6 Claims**

1. In a quartz crystal wrist watch, the improvement which comprises a quartz crystal time standard oscillator means for providing a high frequency time standard signal, a dividing circuit for providing low frequency time [signals] *signal* in response to said time standard [signals] *signal* from said time standard oscillator means, a stepping motor being driven in response to the low frequency timing signals applied by said dividing circuit, said stepping motor including a driving coil, a yoke formed of high permeability materials disposed through said driving coil and formed with spaced ends defining poles lying in the same plane as said driving coil and a rotor disposed in the gap between said poles and lying in the same plane as said driving coil; battery power means coupled to said time standard oscillator means, dividing circuit and driving coil for energizing same; a support plate; said driving coil, battery



power means and quartz crystal time standard oscillator means being supported on peripheral regions of said plate out of overlapping relation with each other and with said rotor; a bridge member; and a gear train mechanically coupled to said rotor to be driven thereby, said rotor and at least the portion of said gear train coupled thereto being supported by said bridge member and said plate at a central region of said plate.

Re. 29,404

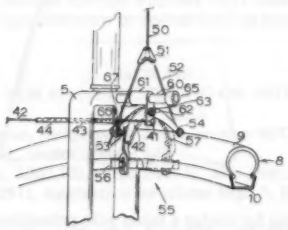
BRAKING SYSTEM

Bertram G. Blevens, Louisville, Ky., assignor to The Huffman Manufacturing Company, Miamisburg, Ohio

Original No. 3,842,946, dated Oct. 22, 1974, Ser. No. 343,890, Mar. 22, 1973. Application for reissue Oct. 12, 1976, Ser. No. 731,564

Int. Cl.[2] **B62L** *1/12, 3/08*

U.S. Cl. 188—24 **6 Claims**



1. For use with a bicycle, including a frame and wheel forks, wheels rotatably mounted in said wheel forks and means for imparting rotation to said wheels for propelling the bicycle, the combination therewith of an improved braking system, which comprises:

A. brakes mounted near the periphery of each of said wheels for application of braking effort to the peripheral portion of each of said wheels:

B. means for applying effort to a first brake:

C. the improvement of motion transmission means for translating vehicular momentum to linear movement for application of effort to the other of said brakes, comprising:

1. a movable mounting means for said first brake;

a. said mounting means comprising a sliding mechanism including:

1. a supporting structure for said sliding mechanism *having an elongated portion which extends transverse to the axis of rotation of a first one of said wheels* fixedly mounted to the frame of said bicycle *adjacent said first one of said wheels thereof*, and,

2. a mounting member slidably mounted thereon, said mounting member being movable *only* in the direction *along said elongated portion transverse to the axis* of rotation of said *first one of said* wheels in response to the motion of said *first one of said* wheels and the braking effort of the brake in engagement [with one of said wheels] *therewith*;

3. the further improvement in which said supporting structure is a post and said mounting member is a sleeve slidably mounted thereon, and;

2. linkage means in operative relation with said movable mounting member and said other brake for transmitting motion from said movable mounting member to said other brake and for application of brake engaging effort to said other brake.

Re. 29,405

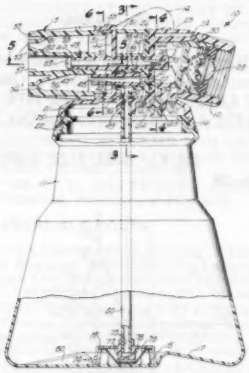
SPRAY APPARATUS

Rudolph M. Gunzel, Jr., San Marino; Donald R. James, West Covina, and Tony Radecki, Altadena, all of Calif., assignors to Meiko, Incorporated, Los Angeles, Calif.

Original No. 3,940,069, dated Feb. 24, 1976, Ser. No. 510,764, Sept. 30, 1974. Continuation-in-part of Ser. No. 408,175, Oct. 19, 1973, abandoned. Application for reissue Apr. 2, 1976, Ser. No. 673,309

Int. Cl.[2] **B05B** *7/04, 7/30, 1/16*

U.S. Cl. 239—318 **26 Claims**



1. Apparatus for mixing a liquid with pressurized water and providing a spray thereof, comprising:

an open-topped container for receiving a quantity of said liquid;

a cap carried by said container including means for connecting the cap to a supply of pressurized water with a water inlet opening in communication with said pressurized water and further having a port communicating with the container interior;

a cylindrical body rotatably mounted on said cap including first and second passages extending through said body, arranged to be individually aligned with said water inlet opening at respective different positions of rotation, said body having walls defining first and second openings interconnecting the respective first and second passages to the body exterior and so located as to align with the port in said cap when the respective passage is aligned with the water inlet opening;

a nozzle interconnected with said cylindrical body for ejecting a spray; and

a single, open-ended, hollow tube carried by said cap having one open end interconnected with said port in said cap and the other open end extending into said container, said tube other end terminating in means having an opening for receiving liquid from the container and said opening in said means having a lesser sectional area than that of the tube one open end or that of the port in said cap.

Re. 29,406

DOCUMENT ORIGINAL HANDLING SYSTEM

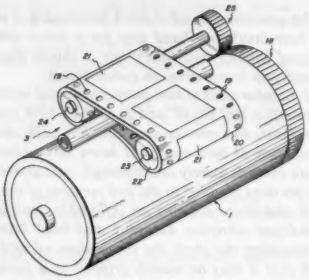
David Athelton Walker-Arnott, Bletchley, England, assignor to Xerox Corporation, Stamford, Conn.

Original No. 3,953,122, dated Apr. 27, 1976, Ser. No. 526,560, Nov. 25, 1974. Application for reissue July 16, 1976, Ser. No. 706,029

Claims priority, application United Kingdom, Dec. 21, 1973, 59528/73

Int. Cl.[2] **G03G** *15/00*

U.S. Cl. 355—12 **21 Claims**



1. In a reproducing machine including means for forming an image of information on an original and means for transporting said original past said imaging means the improvement wherein, said transport means comprises:

a strip member having a plurality of original receiving pockets and means for moving said member past said imaging means with said pockets arranged to present said originals to said imaging means for forming said image.

Re. 29,407

SURFACE EXPOSURE DEVICE FOR COPYING APPARATUS

Masaya Ogawa, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Original No. 3,825,339, dated July 23, 1974, Ser. No. 341,782, Mar. 15, 1973. Application for reissue May 19, 1976, Ser. No. 688,073

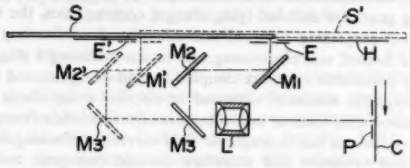
Claims priority, application Japan, Mar. 29, 1972, 47-31389

Int. Cl.[2] **G03B** *27/48, 27/50, 27/70*

U.S. Cl. 355—51 **7 Claims**

1. A device for the optical exposure of an original on copying material which is movably arranged, comprising a housing structure; a support surface horizontally slidably provided in one housing wall and made of transparent material, the original being arranged on the support surface; an exposure plate provided in the housing structure spaced from the support surface and over which the copying material is moved; exposure means arranged between the support surface and the exposure

plate and including a lens assembly arranged in the housing structure in position to transmit rays of light carrying an image of the original towards the copying material through the exposure plate; a reflector arrangement located between the lens assembly and the support surface and including a plurality of mirrors divided into first and second groups, the two groups being conjointly displaceable and the first group being movable reciprocally in the direction opposed to the direction of travel of the support surface; guide means arranged in the housing for guiding the groups of mirrors for conjoint movement parallel to the direction of travel of the support surface; and control means connected to the first and second groups of mirrors and the support surface and operable, upon movement of the mirrors, to modify a first ray path between one mirror of the first group and at least one mirror of the second group in a manner equal and opposite to the modification of a second ray



path between at least one mirror of the second group and said lens assembly, whereby an image ray extending between the support surface and [one mirror] said lens assembly, produced on exposure of the original, always follows a path of constant length regardless of the position of a mirror with respect to the original, said control means also operable, upon said movement of the mirrors, to move the support surface in the opposite direction to the direction of travel of any of said first and second groups, said support surface, said first and second groups and said copying material satisfying the following relationships.

$$Vp = Vo + .\ Va$$

$Vb = \frac{1}{2} \cdot Va$ wherein Vp is a velocity of transference of the copying material, Vo and Va are velocities of movement of the support surface and the first group, respectively, and Vb is a velocity of movement of the second group.

Re. 29,408

PROCESS FOR TREATING ARTICLES OF MANUFACTURE TO ELIMINATE SUPERFLUOUS PROJECTIONS

Henry C. Geen, Brooklyn, and Edwin E. Rice, Ann Arbor, both of Mich., assignors to Chemotronics International, Inc., Ann Arbor, Mich.

Original No. 3,475,229, dated Oct. 28, 1969, Ser. No. 723,052, Apr. 22, 1968. Continuation-in-part of Ser. No. 643,890, June 6, 1967, abandoned. Application for reissue Sept. 25, 1975, Ser. No. 616,605

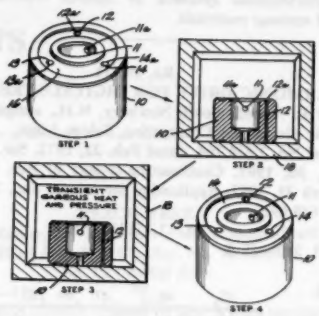
Int. Cl.[2] **B23K** *27/00*

U.S. Cl. 148—9 R **23 Claims**

1. The process for the elimination of superfluous thin cross-section [surface projections including] unwanted burrs [and], *flashings, surface irregularities or* sharp edges on an article of manufacture with a much thicker cross-section, the [projections] *superfluities* being produced as the result of shaping or fabricating which forms the article of manufacture, which comprises:

(a) providing a sealed and confined space surrounding the [superfluous surface projections] *superfluities* to be eliminated on the article of manufacture such that there are open spaces within the sealed and confined space surrounding the [superfluous projections] *superfluities* to be eliminated; and

(b) generating a transient thermal energy release in a gaseous medium *within the sealed and and confined open space* thereby producing transient elevated gaseous temperatures in the open spaces within the sealed and confined space, sufficient thermal energy being generated to thermally eliminate the [superfluous projections] *superfluities* without damage to the article of manufacture *and without material alteration of the dimensions and configuration of the article of manufacture.*



Re. 29,409

PHENOXARSINE COMPOUNDS INCORPORATED INTO RESINS WITH PHENOLS

Charles C. Yeager, Andover, Mass., assignor to Ventron Corporation, Beverly, Mass.

Original No. 3,288,674, dated Nov. 29, 1966, Ser. No. 440,013, Mar. 15, 1965. Application for reissue Mar. 22, 1976, Ser. No. 668,951

Int. Cl.[2] **A61K** *31/10, 31/74, 31/285*

U.S. Cl. 424—78 **10 Claims**

1. A method of incorporating microbicidal amounts of phenoxarsine compounds into vinyl resin material which comprises dissolving a phenoxarsine compound selected from the group consisting of 10-halophenoxasines, alkyl substituted 10-halophenoxarsines, halogen substituted 10-halophenoxarsines and derivatives of phenoxarsines wherein said derivatives are selected from the group consisting of 10,10'-oxybis phenoxarsine, 10-thiocyanato phenoxarsine and 10,10'-thiobis phenoxarsine, in a solvent selected from the group consisting of phenol, alkyl phenols, chlorinated phenols, amino phenols, dihydric phenols, aliphatic alcohols having 5 to 12 carbon atoms and monocarbocyclic acids having 5 to 12 carbon atoms, admixing said solvent solution with said vinyl resin material and processing said admixture to desired solid physical form.]

Re. 29,410

PROCESS FOR MANUFACTURING OF DEODORIZING AIR FILTERS

Toshio Yoshino, Nishinomiya, Japan, assignor to C. Weinberger & Co., Ltd., Osaka, Japan

Original No. 3,857,732, dated Dec. 31, 1974, Ser. No. 123,798, May 24, 1971. Application for reissue Sept. 5, 1975, Ser. No. 610,819

Claims priority, application Japan, May 23, 1970, 45-44204

Int. Cl.[2] **B32B** *27/12;* **C09D** *3/76*

U.S. Cl. 427—390 R **7 Claims**

1. Process for manufacturing a deodorizing gas filter which comprises dissolving polyvinyl alcohol in water; adding to said solution at least one substance which is an amphoteric ion exchange resin, activated carbon or coconut shell charcoal, thereby forming a pasty mass; adding to said pasty mass glyoxal in the amount in excess of that which would be sufficient to acetalize the polyvinyl alcohol, and a small amount of acid for the acetal formation; impregnating the resulting composition into a non-woven textile fabric gas filter; and heating said impregnated filter at about 70°–100° C for 30 minutes to 2

hours, thereby converting said polyvinyl alcohol to polyvinylacetal.

7. Process as claimed in claim 1, wherein said non-woven textile fabric gas filter utilizes the fibers of at least one of nylon, cotton or other conventional synthetic or natural materials including foamed resinous materials.

Re. 29,411

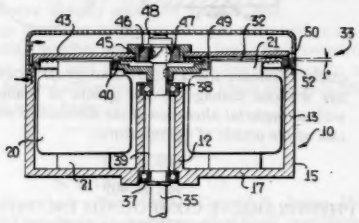
HARMONIC DRIVE FOR DIGITAL STEP MOTOR

Harold R. Newell, South Newbury, N.H., assignor to Mesur-Matic Electronics Corporation, Salem, Mass.

Original No. 3,644,764, dated Feb. 22, 1972, Ser. No. 664,331, Aug. 30, 1967. Continuation-in-part of Ser. No. 627,410, March 31, 1967. Application for reissue Jan. 13, 1976, Ser. No. 648,693

Int. Cl.[2] H02K 7/06

U.S. Cl. 310—49 R **10 Claims**



1. A motion transmitting system, comprising a pair of cooperating gears having confronting frictional surfaces projecting from normally spaced generally parallel planes, electronmagnetic means for selectively deflecting sequential points of one of said gears toward and away from the other to produce sequential engagement of said frictional surfaces at instantaneously limited regions of said gears, said gears having mutually different configurations adapted to provide continued digital rotations of said one gear responsive to said deflections, a shaft, and universal joint means coupling one of said gears to said shaft, said universal joint means being arranged for wholly free axial and pivotal movement *over at least a predetermined range of movement* without radial movement relative to said axis, wherein each of said frictional surfaces comprise teeth, and wherein said frictional contact is achieved by engagement of said teeth, said different configurations being produced by different numbers of teeth on said gears, wherein said cooperating gears are annular, lying along a common axis, the teeth thereof projecting from normally uncurved confronting surfaces thereof, said electromagnetic means including a magnetically permeable armature coupled to said one gear, and electromagnetic actuators disposed in circular array about said common axis, each of said actuators effective when energized to produce an electromagnetic field exerting deflecting forces on said armature and therefore on said one gear coupled thereto, wherein said armature comprises a rigid circular plate, said ring gear fastened to a planar surface thereof adjacent the periphery of said plate, a shaft extending along said axis and through said plate, normally perpendicular thereto, said plate retained on said shaft to permit relative rotation and limited angular orientation therebetween from the normally perpendicular relationship.

PLANT PATENTS

GRANTED SEPTEMBER 20, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,106
NECTARINE TREE
Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351
Filed July 28, 1976, Ser. No. 709,613
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree as illustrated and described which bears medium, clingstone, fruit having yellow flesh; characterized by ripening approximately 10 days earlier than the Zee Gold (U.S. Plant Pat. No. 3,087), and further characterized in comparison with other varieties by early maturing fruit of uniform size with a high degree of red skin color and good long distance shipping quality.

4,107
NECTARINE TREE
Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351
Filed July 28, 1976, Ser. No. 709,614
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, bearing large, yellow flesh, clingstone fruit approximately the same maturity season as Late Le Grand Nectarine (U.S. Plant Pat. No. 1,035), but being an improvement over other nectarines in this maturity season by producing fruit with a higher degree of red skin color. The nectarine tree is further characterized for heavy production, regular bearing of large firm high colored fruit, with long distance shipping quality.

4,108
PEACH TREE
Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351
Filed July 28, 1976, Ser. No. 709,615
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of peach tree bearing large, yellow flesh, clingstone peaches with a high degree of exterior red color, characterized as to novelty when compared to its seed parent, Royal Gold, (U.S. Plant Pat. No. 2,663) by having fruit of larger size, a higher degree of red color and a greater distribution of uniform fruit throughout the tree.

4,109
PEACH TREE
Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351
Filed Sept. 1, 1976, Ser. No. 719,667
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, as illustrated and described, which bears large, yellow flesh, clingstone fruit of early maturity. The fruit is further characterized in comparison with other early maturing varieties, by having greater firmness and a higher degree of red color, with excellent shipping quality.

4,110
NECTARINE TREE
Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351
Filed Sept. 1, 1976, Ser. No. 719,668
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree as illustrated and described, characterized by its early maturity of medium size, yellow fleshed, clingstone fruit. The skin of the fruit having a yellow ground color being nearly overspread completely with red and further characterized a vigorous, large tree of regular bearing early nectarines ripening 4 to 5 days before Red June (U.S. Plant No. 2,044).

PATENTS

GRANTED SEPTEMBER 20, 1977

ERRATA

For CLASS	See PATENT NO.
280–011.37 K	4,048,700
222–448	4,049,144
225–094	4,049,171
206–611	4,049,190
292–307 R	4,049,313
428–539.5	4,049,380
029–157.1 R	4,049,389
062–002	4,049,407
062–197	4,049,410
429–193	4,049,468
250–233	4,049,644
542–426	4,049,647
542–426	4,049,648
542–400	4,049,649
542–400	4,049,650
544–021	4,049,651
544–054	4,049,652
544–150	4,049,653
544–221	4,049,654
424–248.5	4,049,655
548–342	4,049,671
548–342	4,049,672
560–118	4,049,697
560–127	4,049,698
560–105	4,049,699
560–105	4,049,700
560–130	4,049,701
261–062	4,049,758
358–185	4,049,907
260–002.5 AC	4,049,931
363–059	4,050,004
363–059	4,050,005
363–098	4,050,006
363–087	4,050,007
335–038	4,050,039
364–200	4,050,058
364–200	4,050,059
364–200	4,050,060

PATENTS

GRANTED SEPTEMBER 20, 1977

ERRATA

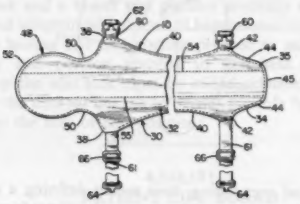
Cl.	Class	Patent No.
280-011.17 G		4,048,700
222-448		4,049,144
222-004		4,049,171
206-811		4,049,190
242-107 R		4,049,313
428-539.5		4,049,380
029-197.1 R		4,049,389
042-070		4,049,407
062-197		4,049,410
429-191		4,049,488
280-233		4,049,644
242-458		4,049,847
242-458		4,049,904
242-400		4,049,949
242-400		4,049,952
244-021		4,049,971
244-034		4,049,973
244-150		4,049,977
244-233		4,049,994
424-244.1		4,049,995
340-343		4,049,971
340-343		4,049,975
340-115		4,049,977
340-127		4,049,998
340-103		4,049,999
340-107		4,049,700
340-130		4,049,701
281-002		4,049,724
128-133		4,049,707
260-023.5 AC		4,049,971
340-039		4,050,000
361-039		4,050,002
324-208		4,050,006
340-087		4,050,007
235-033		4,050,008
364-200		4,050,009
364-200		4,050,009
364-200		4,050,040

PATENTS

GRANTED SEPTEMBER 20, 1977

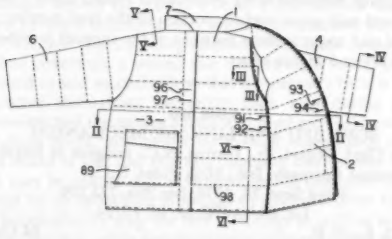
GENERAL AND MECHANICAL

4,048,674
ARM GUARD FOR ARCHERS
John C. Chesnick, 4070 Marshall, Wheatridge, Colo. 80033
Filed Jan. 22, 1976, Ser. No. 651,229
Int. Cl.[2] A41D *13/08*
U.S. Cl. 2—16 **8 Claims**



1. An arm guard for archers comprising an elongated forearm cover portion having fastener means adapted to be drawn together around the forearm of the wearer so that said forearm cover portion conformably surrounds the inner side of the wearer's forearm, an elbow covering forming a longitudinal continuation of said forearm cover portion, said elbow covering adapted to overlay and conform to the configuration of the inner side of the elbow joint when the arm of the wearer is straightened, said elbow covering being unattached to the arm of the wearer so as to be free to allow movement of said main forearm portion when the arm is flexed or twisted, said elbow covering being of relatively shallow concave configuration and having an external, rounded peripheral edge.

4,048,675
JACKET CONSTRUCTION
Donald C. Griffin, Englewood, Colo., assignor to Plain Brown Wrapper, Inc., Englewood, Colo.
Filed Jan. 12, 1976, Ser. No. 648,246
Int. Cl.[2] A41D *1/00*
U.S. Cl. 2—93 **12 Claims**



1. In an outdoor jacket, such as a ski jacekt, of the down-filled type, the combination comprising:

a plurality of panels each comprising superposed inner and outer sheets, the peripheral edge strips of said inner sheet and outer sheet being folded under through substantially 180° to edge each sheet with a U-section, outwardly convex fold, the folded under edge strips of said inner sheet and outer sheet lying sandwiched between said sheets of said panel and face-to-face with each other and forming substantially a UU-shaped cross section edge zone for said panel;

a first stitch line substantially parallel to the panel edge, said first stitch line passing through the two thicknesses defined by said folded under face-to-face edge strips near said folds thereof and closing said panel edges to form a down-proof envelope;

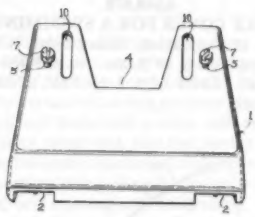
a downlike material within said envelopes and distributed substantially uniformly throughout each of said envelopes;

a second stitch line through the four-sheet thickness of said UU-shaped cross section envelope edge zone and spaced from the panel edge by said first stitch line;

a pair of said panels being fixed together in edge-to-edge relation with the adjacent UU-section edge zones of said panel pair each being turned through about 90° from the plane of their respective panel to extend toward the interior of the jacket, with the outer sheets of said panels abutting in said edge zones and forming an eight thickness, substantially UUUU-cross section panel pair joinder zone;

a third stitch line securing said pair of panels together in said edge-to-edge relation, said third stitch line being spaced close inboard from said UUUU-cross section zone free of contact with said folded under edge strips and passing through only one half the sheet thicknesses of each UUU-U-cross section zone, the first, second and third stitch lines each penetrating a different combination of said peripheral edge strips and sheet portions bound thereby.

4,048,676
COVERING PIECE FOR A WATER CLOSET ASSEMBLY
Cyril James Brookes, Campbelltown, Australia, assignor to Reed Building Products, Pty. Limited, Elizabeth, Australia
Filed Oct. 8, 1976, Ser. No. 730,824
Int. Cl.[2] A47K *17/00*
U.S. Cl. 4—1 **10 Claims**



1. A cover-piece between a freestanding toilet bowl and an independent wall-supported flush tank providing a cover therebetween comprising

a. a cover plate supporting bracket attached to the wall below the independent wall-supported flush tank,

b. a cover plate adapted to be supported by said bracket,

c. means for connecting said cover plate to said bracket for slidable adjustment thereover relative to the freestanding toilet bowl, and

d. means to clamp said cover plate upon said bracket in a predetermined position between the freestanding toilet bowl and the independent wall-supported flush tank.

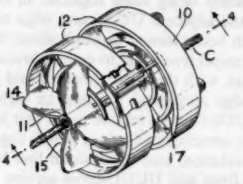
4,048,677
TURBULENCE INHIBITORS
Anton J. Kajlich, 228 106th Place, NE., Bellevue, Wash. 98004
Filed June 2, 1975, Ser. No. 582,896
Int. Cl.[2] E04H *3/16, 3/18;* **B63B** *21/52*
U.S. Cl. 4—172 **10 Claims**

1. A turbulence inhibiting device adapted to be assembled as one of a plurality of such devices in axial alignment with one another to provide a turbulence inhibiting lane, said device comprising:

a. a central hub having a longitudinal axis

b. an annular band postioned generally concentrically around said hub with ends of said hub extending axially beyond circumferential edge portions of said band,

c. a plurality of generally planer vanes extending radially from said hub to said band, the plane of each of said vanes being substantially aligned with said longitudinal axis, said vanes projecting axially beyond said hub so as to be able to engage vanes of an adjacent device and limit relative rotation between such adjacent devices,



d. said hub, band and vanes defining substantially open space within said band for substantially free flow of water therethrough,

whereby with a plurality of such devices arranged in axial alignment, adjacent bands provide openings therebetween for flow of water through said openings, said vanes and said bands define axially aligned passageway means for flow of water axially within the aligned devices, and vanes of proximate devices overlap one another so that with proximate devices rotating relative to one another, engagement of proximate vanes limits such relative rotation to arcuate increments of travel between proximate vanes.

4,048,678

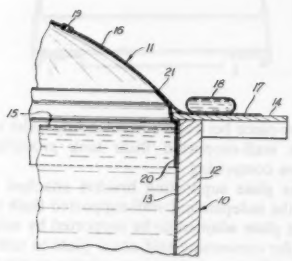
INFLATABLE COVER FOR A SWIMMING POOL

Joseph Chillino, 15 Clark Road, Stoney Point, N.Y. 10980

Filed Nov. 5, 1975, Ser. No. 629,084

Int. Cl.[2] E04H *3/16, 3/18;* **F16L** *22/02*

U.S. Cl. 4—172.12 **1 Claim**



1. A device for use in a swimming pool having interconnected side walls enclosing a closed area, said pool containing water to a depth to substantially cover the side walls and a deck extending above the side walls and connected with the top rim of all the side walls, comprising a pool cover having a curved dome extending above the entire area of the pool, side sheets integral with said dome and extending around the entire area of the pool, said side sheets being located upon said deck, means holding said side sheets upon said deck, and an inner skirt connected with the inner surfaces of said dome adjacent the pool edge and extending around the entire rim area of the pool, said skirt depending from said side sheets and engaging the inner surfaces of all said side walls along the outer surfaces of the skirt and extending substantially into the water depth of the pool.

4,048,679

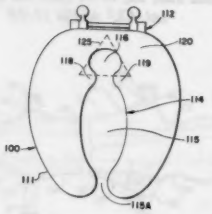
TOILET SEAT

Wayne A. Garnett, 1810 Oliver Ave. North, Minneapolis, Minn. 55411

Continuation of Ser. No. 486,447, July 8, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,274

Int. Cl.[2] A47K *13/00*

U.S. Cl. 4—237 **4 Claims**



1. A toilet seat comprising: base means defining a narrow, elongate central opening; said base means having side members and a rear member connected to the side members, a pair of mutually opposed support members connected to said side members, said support members projected transversely inward of said central opening and located rearwardly in said opening dividing the opening into a forward opening and a rear opening, said support members being laterally spaced from each other providing an open passage between the forward opening and rear opening and having a width substantially smaller than the width of either the forward or rear openings, said rear member having an upper surface portion adapted to engage and support the base of the spine of a person seated on the seat, each of said support members having an upper surface portion adapted to engage and support an ischium of the person, said upper surface portion of the rear member and the upper surface portions of the support members being located at the corners of a generally triangular outline, said upper surface portions of the support members being inclined inwardly and downwardly in substantially the same elevation and said upper surface portion of the rear member being located in substantially the same elevation of the upper surfaces portions of the support members whereby the base of the spine and the ischia of the person evenly and concurrently engage the upper surface portions of the rear member and the upper surface portions of the support members, said upper surface portions of said support members being transversely spaced about 3 inches apart, and said upper surface portion of the rear member and each of said upper surface portions of the support members is spaced about 5 inches apart.

4,048,680

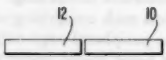
SOFA BED AND LINKAGE MECHANISM

Walter Clark Rogers, Jr., Denton, N.C., assignor to Royal Development Company, Inc., High Point, N.C.

Filed Sept. 14, 1976, Ser. No. 723,159

Int. Cl.[2] A47C *17/10, 17/14*

U.S. Cl. 5—37 R **14 Claims**



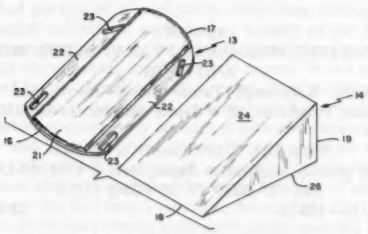
1. A sofa bed comprising in combination a base, a seat, and a back, first linkage means interconnecting the back and seat mounting them relative to the base for movement relative to each other between a sofa position wherein the seat extends generally in a horizontal plane and the back extends generally in upright position from the rear of the seat, and a bed position

wherein the back and seat extend in coplanar horizontal relationship, and second linkage means including a link fixed to the seat to be movable therewith for actuating the first linkage means to move the sofa bed between said sofa and bed positions upon initial raising of a forward portion of the seat, and wherein said first linkage means includes a seat link fixed to the seat to be movable therewith, a back link fixed to the back to be movable therewith, a seat mounting link having an upper end portion pivotally connected to the seat link and a lower end portion pivotally mounted to the base, a back mounting link having an upper end portion pivotally connected to the back link and a lower end portion pivotally mounted to the base, and wherein said second linkage means includes a control linkage having one end portion pivoted to said seat link and another end portion pivoted to said seat mounting link whereby the seat link must be raised relative to the base to actuate the control linkage to permit the sofa bed to be moved to either the sofa or bed position.

4,048,681
PATIENT LIFT BOARD

Evelyn Mae Baulch, and John Alan Baulch, both of 3314 Glendora Drive, San Mateo, Calif. 94403

Filed Sept. 15, 1976, Ser. No. 723,517
Int. Cl.[2] A61G *7/08, 1/00;* **A47G** *21/00, 9/00*
U.S. Cl. 5—81 R **5 Claims**



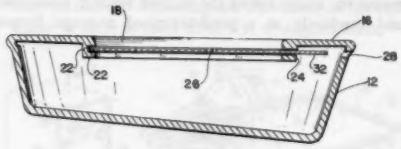
1. Apparatus for use in positioning a patient confined to a bed including bed coverings on the upper surface thereof, comprising a rigid board, one end on said rigid board being configured to extend across the width of the patient's back in a position proximate to the bottom of the patient's spine, an opposing end on said rigid board being configured to extend to a position behind the patient's head, a first side on said rigid board having a smooth surface without protrusions therefrom, said first side thereby being adapted for slidable contact with the bed coverings, a second side on said rigid board, padding attached to said second side so that the patient's back is rigidly supported throughout the entire back area during patient movement and the patient's back and head are cushioned from said rigid board, and means for manual engagement on said rigid board at said one end and opposing end, so that the patient may be placed atop said padding and thereafter may be moved by an unassisted attendant in sliding fashion laterally and longitudinally atop the bed coverings as well as in elevation on the bed while simultaneously supporting the patient's back.

4,048,682
BED PAN

Pattie Smith, 252 Highwood Ave., Ridgewood, N.J. 07410

Filed Oct. 13, 1976, Ser. No. 732,007
Int. Cl.[2] A61G *7/04, 9/00*
U.S. Cl. 5—91 **3 Claims**

1. An improved bed pan comprising an elliptically shaped vessel including a continuous vessel forming sidewall, a bottom wall, and a top wall, said top wall having a recess therein through which waste material may be deposited into said vessel in the usual fashion by a user thereof, a downwardly turned lip in said top wall defining said recess therein, said lip being spaced from said sidewall so that said recess is spaced from said sidewall and said top wall extends between said recess and said sidewall, a plate member underlying said mouth

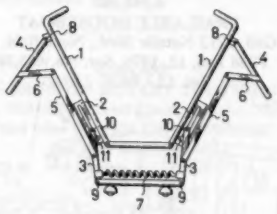


of said recess, said plate member being slidably mounted in said lip, and means for slidably mounting said plate member in said lip of said vessel so as to permit reciprocable sliding movement thereof for opening and closing said recess.

4,048,683
SPACE-SAVING FOLDING BED

Tiyung Chen, No. 33, She-tzu 9th Street, Shihlin District, Taipei, China

Filed Dec. 2, 1974, Ser. No. 528,718
Int. Cl.[2] A47C *19/12*
U.S. Cl. 5—180 **5 Claims**



1. In a space saving folding bed having a middle frame section supported by a plurality of generally U-shaped rotatable legs, each of said legs comprised of a horizontal portion with generally vertical extending portions pivotally connected to each end of said horizontal portion, said extending portion terminating in an upper end, said bed having frame end portions movable between a horizontal and vertical position, each of said end portions being pivotally connected to said middle frame section, said improvement comprising;

spring means for biasing each of said vertically extending portions of said rotatable legs, towards each other in said horizontal and vertical positions; and

connecting means for allowing a slidable connection, in a direction parallel to said frame end portions, between said upper end of said U-shaped legs and said frame end portion and for permitting said frame end portion and said middle frame section to be slidably lowered to said horizontal portion of said generally U-shaped legs when said frame end portions are in a near vertical position.

4,048,684
INFANT WATERBED

Anneliese F. Korner; Robert L. Piziali, and Orval T. Ellsworth, all of Palo Alto, Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Dec. 10, 1975, Ser. No. 639,288
Int. Cl.[2] A47C *27/08;* **A61G** *7/04*
U.S. Cl. 5—370 **3 Claims**

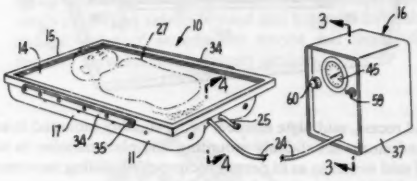
1. An infant waterbed comprising:

a. **a tray that has a recess;**

b. a flexible mattress that sits in the recess of the tray for holding a fluid medium capable of supporting an infant;

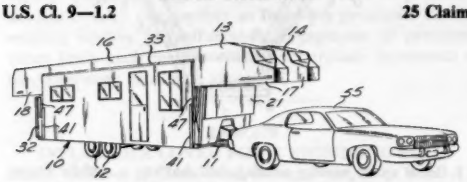
c. a first bladder that sits in the recess in contact with the mattress;

d. a second bladder that is inflated with a predetermined volume of fluid in its normal state;
e. a conduit interconnecting the first bladder and the second bladder;
f. means for compressing the second bladder intermittently and randomly at a predetermined average frequency



whereby the fluid is forced from the second bladder through the conduit into the first bladder when the second bladder is compressed; and
g. means for forcing the fluid from the first bladder back through the conduit into the second bladder when the second bladder is not compressed.

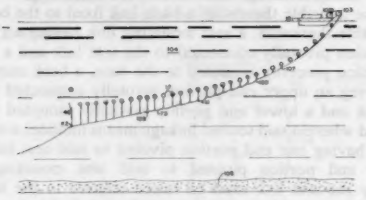
4,048,685
TRAILABLE HOUSEBOAT
William A. Gail, 7212 Natalie Blvd., Northfield, Ohio 44067
Filed Feb. 12, 1976, Ser. No. 653,381
Int. Cl.² B63C *13/00*
U.S. Cl. 9—1.2 **25 Claims**



1. A trailable boat comprising a main body including a cabin and road wheels, a pair of pontoons mounted on said body for movement between a raised road position along the roof of said cabin and a lowered water position adjacent to opposite sides of said cabin, said pontoons extending beyond the ends of said cabin and having end portions of a first depth, said pontoons in said water position operating to float said main body with said wheels substantially out of the water and the floor of said cabin substantially above the water while the end portions of said pontoons provide an upper deck surface substantially above the water, said pontoons providing a central portion of reduced depth proportioned to fit over said cabin whereby said pontoons in said road position extend above said roof by a height substantially less than first depth, said end portions projecting below the level of said roof by a distance at least substantially equal to the depth of said central portion when said pontoons are in said road position.

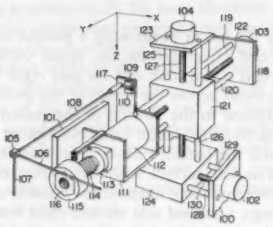
4,048,686
BUOYANCY DEVICE AND METHOD
Sigmund Ege, Oslo, Norway, assignor to Kløften & Kløften A/S, Oslo, Norway
Filed July 9, 1976, Ser. No. 704,017
Int. Cl.² B63B *21/52*
U.S. Cl. 9—8 R **12 Claims**

1. A buoyancy device for at least partially supporting a submerged article comprising:
A. walls defining a submersible chamber,
B. a substantial volume of gas enclosed in said chamber,
C. access means to the lower portion of said chamber for water surrounding said buoyancy device, said water rising within said chamber and compressing said gas with increasing submergence of said buoyancy device,
D. a supply of flexible line supported by said buoyancy device, one end of said line being supportingly fastened to said submerged article,



E. means within said chamber gripping and paying out said line thereby changing the distance between said buoyancy device and said article,
F. means braking said paying out means, and
G. means controlling said braking means, said controlling means being responsive to the level of the water within said chamber.

4,048,687
AUTOMATIC ASSEMBLY APPARATUS FOR BOLTS AND NUTS
Kanji Kato, Kokubunji; Tatsuo Goto, Tokyo, and Tadao Inoyama, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Dec. 2, 1975, Ser. No. 636,840
Claims priority, application Japan, Dec. 4, 1974, 49-138394
Int. Cl.² B23P *19/08*; B23Q *17/18*
U.S. Cl. 10—155 R **28 Claims**



1. An automatic assembling apparatus comprising:
first means for holding a first object, which is screwed on a second object supported by a holder;
second means coupled with said first means, said second means being movable in an axial direction and in a rotating direction with respect to a center axis of said second means, and said second means being capable of inclination with respect to the center axis thereof;
third means for detecting the displacement of said second means;
fourth means for driving said first means to screw said first object on said second object; and
fifth means for controlling said fourth means, said fifth means receiving signals from said third means;
wherein sixth means are included for detecting a position of said second object and seventh means are included for moving said first means within a plane at right angles with respect to the center axis of said first means, said seventh means being controlled by said fifth means, to which signals from said sixth means are supplied.

4,048,688

CONTROL MECHANISM FOR EDGE FOLDING MACHINES

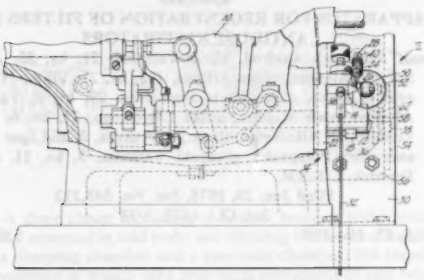
Ivan Percy Crouch, Leicester, England, assignor to USM Corporation, Boston, Mass.

Filed Oct. 4, 1976, Ser. No. 729,011

Claims priority, application United Kingdom, Oct. 4, 1975, 40698/75

Int. Cl.[2] A43D *11/00*; B05C *3/02*

U.S. Cl. 12—55.1 4 Claims



2. Edge folding machine for progressively folding over a marginal portion of a workpiece, comprising folding instrumentalities movable at an operating locality of the machine, workpiece feeding means for feeding a workpiece step-by-step through the operating locality, a feed control device by which the feed length of each feed movement of the workpiece feeding means can be varied, said device including a feed control shaft which is operatively connected with a workpiece feeding means and rotation of which is effective to cause the feed length to be varied as aforesaid, and setting means for setting maximum and minimum lengths to the rotation of said shaft, and thus to the feed length variation, the machine also comprising a reciprocatory slitting knife mechanism, operable in timed relation with the operation of the workpiece feeding means, for slitting the marginal portion of the workpiece fed by the workpiece feeding means as aforesaid, and an actuator by which the slitting knife mechanism can be brought into operation, characterized by the provision of a lever (26) mounted on the feed control shaft (12), a lever (36) connected to the lever (26) by means of a telescopic link (34), said lever (36) providing a surface (62) engageable by an abutment (60) carried by a fixed-stroke actuator (54, 58), whereby said fixed-stroke actuator (54, 58) is operable when the first-mentioned actuator is operated to bring the slitting knife mechanism into operation, and further wherein the first-mentioned lever (26) is also movable, together with the feed control shaft (12), independently of the fixed-stroke actuator (54, 58).

4,048,689

MEAT CLEANING MACHINE

Anthony L. Fullenkamp, Fort Loramie, and Herman F. Russell, Dayton, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Feb. 19, 1976, Ser. No. 659,473

Int. Cl.[2] A22C *17/08*

U.S. Cl. 15—3.17 8 Claims

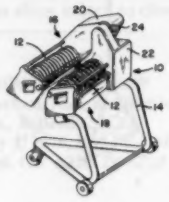
1. In a meat handling machine having a centrally open meat driving cylinder including a plurality of axially aligned and spaced meat driving rings each having outwardly projecting teeth, means for driving said cylinder about the axis thereof and meat cleaning means positioned within said cylinder to clean the surface of a piece of meat engaged by said teeth, the improvement comprising:

a. a ring supporting framework consisting of:

i. a pair of opposed, one piece, centrally open end frames positioned axially outwardly of said rings, and

ii. means interconnecting said end frames, extending axially of said cylinder and positioned solely outside the periphery thereof,

b. each of said end frames including at least three seats angularly spaced about said axis of said cylinder with the seats on one end frame aligned with those on the other end frame to form at least three sets of aligned seats,



c. at least one of said sets of seats being positioned on an opposite side of said axis of said cylinder from the others of said sets of seats, and

d. at least three ring support members, each having the ends thereof received and mounted in said end frames with said ring support members having portions engaging inwardly disposed surfaces of said meat driving rings in supporting relationship thereto.

4,048,690

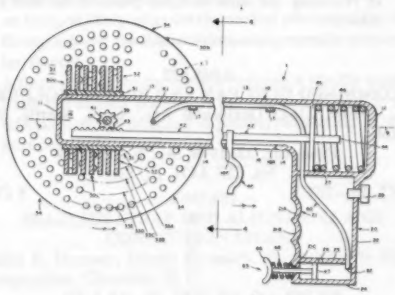
TWIN-BRUSHES ROTARY TOOTHBRUSH

Alan Wolfson, 10340 Fieldcrest Court, Omaha, Nebr. 68114

Filed May 27, 1976, Ser. No. 690,607

Int. Cl.[2] A46B *13/08*

U.S. Cl. 15—22 R 12 Claims



1. A twin-brushes rotary toothbrush comprising:

A. a horizontally longitudinally extending elongate tubular barrel having a fore-end and a rear-end, and longitudinally horizontally extending elongate topside and bottomside;

B. handle means at the barrel rearward portion;

C. a pair of transversely separated upright rotary brushes, each of said brushes comprising an upright support rotatably secured to the barrel forward portion with a common axle means lying along a horizontal transverse-axis whereby the two brushes are rotatable in co-angular unison about said transverse-axis, each of said rotary brushes comprising an array of horizontal bristles extending transversely inwardly from the brush upright support toward the barrel, the free-ends of the bristles lying along an upright imaginary-plane located proximally outwardly said barrel; and

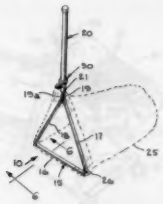
D. bi-directional powering means for imparting coangular rotation to the rotary brushes in pulsating alternating angular directions about said horizontal transverse-axis, said bi-directional powering means extending along said barrel.

4,048,691

TRASH SACK SUPPORT

Glen C. Spangler, 13645 Reeveston Road, Houston, Tex. 77039

Filed Apr. 12, 1976, Ser. No. 675,850
Int. Cl.[2] A47L *13/52*; A47F *13/06*
U.S. Cl. 15—257.1 **9 Claims**



1. An arrangement for supporting a sack to receive articles comprising:

a. generally triangular shaped frame means with which the open end of a sack may be overlapped;

b. handle means engaged with said frame means so that one side of said frame means can be positioned on a surface to enable articles on the surface to be moved into the opened end of the sack; and

c. means adjustably carried on said handle means for engaging the overlapped sack end to retain the sack in position on said frame means, said means adjustably carried on said handle including

1. a member slideably positioned on said handle means;

2. projection means extending from said member including a segment extending longitudinally of said handle means; and

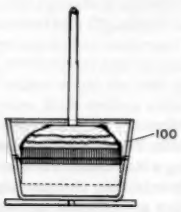
3. a friction surface means on said projection means with which the overlapped sack end may be engaged to aid in retaining the sack in open position on said frame means.

4,048,692

COMBINED DUST PAN AND BROOM HOLDER

D. A. Coffey, 13613 Occidental Ave. South, Seattle, Wash. 98168

Filed Aug. 23, 1976, Ser. No. 716,759
Int. Cl.[2] A47L *13/52*
U.S. Cl. 15—257.2 **8 Claims**



1. A claimed dust pan and broom holder comprising:

a. a receptacle having a pan portion with upwardly and outwardly sloping side walls, and an upstanding rear wall connected to said side walls; a top panel flexible along an axis from front to back and secured in part to said pan portion, disposed in a plane generally parallel to the pan, said top panel terminating its non-secured portion in a terminal portion removably engageable with one of said upstanding side walls of the pan to form an enclosure which is open at the front;

b. a crosswire retainer rotatably secured on one end at the forward end of one side of said top panel, the other end thereof being engageable with either of a pair of apertures on the other side of said top panel, moveable;

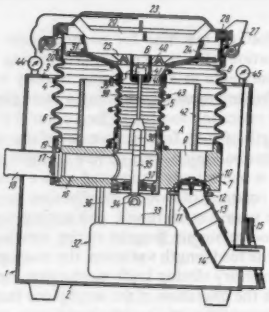
c. a handle means movable from a stowable to a grippable position, secured to the external side of said rear wall of said pan and adopted such that the receptacle can be stored in a vertical position resting on said handle means when said handle means is in the stowable position.

4,048,693

APPARATUS FOR REGENERATION OF FILTERS FOR ANTIDUST RESPIRATORS

Iosif Maxovich Axelrod, ulitsa Vatutina, 21, kv. 35; Anton Savvich Alengoz, ulitsa Artema, 108, kv. 27; Viktor Nikolaevich Luchko, ulitsa Pavla Popovicha, 29, kv. 8; Valentin Alexandrovich Mukhin, ulitsa Levitskogo, 27, kv. 6; Ignat Leontievich Nikolenko, ulitsa Pokrysheva, 5, and Igor Alexandrovich Potapenko, prospekt Vatutina, 3, kv. 11, all of Donetsk, U.S.S.R.

Filed Jan. 29, 1975, Ser. No. 545,312
Int. Cl.[2] A47L *5/38*
U.S. Cl. 15—310 **5 Claims**

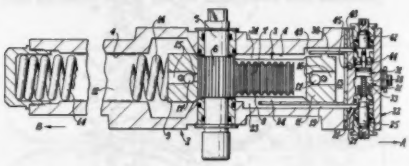


1. An apparatus for regeneration of filters for antidust respirators comprising: a hollow casing; two coaxially mounted bellows with common end walls and a vibratory drive forming a driven pump; one of the end walls of said bellows being rigidly fixed in said casing; said bellows comprising an inner bellows and an outer bellows with a space therebetween; a first passage for admitting air from the outside of said casing to said space between said bellows, and a second passage for discharging air from the internal space of said inner bellows to the outside of said casing, said passages passing through said one end wall; a one-way valve mounted in said first passage for admitting air thereto; the other end wall of said bellows being mounted in said casing and connected to said vibratory drive for reciprocation axially of said bellows; an adapter with a cover attached thereto being also attached to said other end wall, said adapter and said cover defining a filter receiving space therebetween for mounting a filter to be regenerated; first means communicating the internal space of said inner bellows with said filter receiving space; second means communicating the space between said bellows with said filter receiving space; and a non-return valve mounted in said second passage for eliminating an idle stroke of the bellows; said filter to be regenerated having a clean side and a soiled side; said vibratory device being connected to said other end wall for moving said bellows to blow air through said filter in a direction from said filter receiving space to the interior space of said inner bellows, said filter being mounted in said filter receiving space, the clean side of said filter being at the upstream side of the blown air and the soiled side of said filter being at the downstream side of said filter

4,048,694
HYDRAULIC DOOR CLOSER WITH ADJUSTABLE TIME DELAY DAMPENER

Donald John Newman, South Oakleigh, and Gerald Francis Dunphy, Glen Waverley, both of Australia, assignors to Ogden Industries Pty. Limited, Australia

Filed Mar. 1, 1976, Ser. No. 662,368
Claims priority, application Australia, Mar. 7, 1975, 0826/75
Int. Cl.[2] E05F 3/10, 3/12
U.S. Cl. 16—52 14 Claims

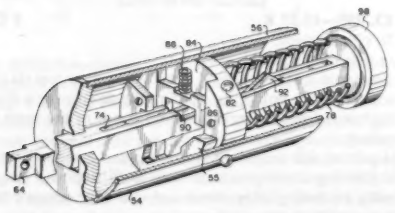


1. A door closer including; a hollow body; a body piston slidably mounted in said body and dividing the interior thereof into a damping chamber and a reservoir chamber, the respective volumes of which vary with axial movement of said body piston relative to said body; first biasing means urging said body piston in a direction to reduce the volume of said damping chamber; escape means through which fluid can be bled from said damping chamber to permit said body piston to move in said direction, including an escape conduit and a compartment having an inlet which communicates with said damping chamber through said escape conduit so as to receive said fluid therefrom, at least in some positions of said body piston relative to said damping chamber, and an escape port through which said fluid received from said damping chamber can be discharged; closure means controlling opening and closing of said escape port and being mounted within said compartment for movement between a rest position and an escape port opening position, said positions being spaced apart and said escape port being maintained closing while said closure means travels between said positions; and second biasing means urging said closure means into said rest position; said closure means being responsive to the pressure of fluid received through said inlet to move towards said escape port opening position against said second biasing means, when said pressure exceeds the influence of said second biasing means on said closure means; whereby a time delay occurs in the opening of said escape port while said closure means moves between said rest position and said escape port opening position.

4,048,695
DOOR CHECK AND CLOSURE DEVICE

Otto H. Juilfs, and Donald R. Juilfs, both of 19701 Lassen St., Chatsworth, Calif. 91311

Filed Nov. 20, 1975, Ser. No. 633,819
Int. Cl.[2] E05F 3/00
U.S. Cl. 16—65 3 Claims

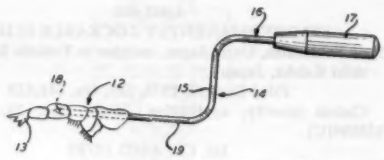


1. A door closure device comprising a cylindrical shell, a spring disposed within said shell, a piston rod adapted to interact with said spring for resisting the opening of a door and for causing closing of a door, a slot disposed longitudinally in said rod, a plate fixedly mounted in said shell against which one end of the spring rests, a slot cut into said plate, a key within said slot which is adapted to engage a niche in said rod to hold a door in an open position, a rotatable cam rotatably mounted within the slot in the rod adapted to allow the key to override the niche in said rod to allow a door to close.

4,048,696
SHRIMP SHELLER

Joseph Maschio, Rutherford, N.J., assignor to Master Machine & Manufacturing Co., Belleville, N.J.

Filed July 1, 1976, Ser. No. 701,880
Int. Cl.[2] A22C 29/02
U.S. Cl. 17—69 4 Claims

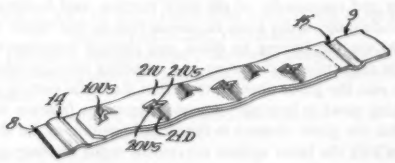


1. A shrimp sheller device comprising
a. a first portion of a device defining a probe having a generally uniform cross-sectional area from one end to the other, dimensioned to be inserted into the body of a shrimp toward the tail, between the shell and the flesh,
b. a second portion of the device extending generally perpendicular to the first portion,
c. an integral sharp edge on the second portion of the device facing toward the first portion, and generally perpendicular thereto,
d. a third portion of the device defining a handle extending from the second portion in the opposite direction to the first portion and disposed in general parallelism to the first portion.

4,048,697
SEALLESS STRAP END ALIGNMENT AND CONNECTION MEANS

William F. Duenser, Mount Prospect, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Apr. 26, 1976, Ser. No. 680,166
Int. Cl.[2] B65D 63/02
U.S. Cl. 24—20 EE 6 Claims



1. A sealless strap connection between overlapped lengths of strap which comprises an array of longitudinally spaced joints, each joint comprising lengthwise protuberances presenting opposed non-interlocking shoulders each having a transverse face displaced from the respective planes of said overlapped lengths of strap and lengthwise protuberances presenting opposed interlocking overlapping shoulders each having a transverse face displaced from the respective planes of said overlapped lengths of strap shaped to interlock with each other, at least one of said protuberances of said array on one of said lengths of strap having, behind the transverse face of one of

said interlocking overlapping shoulders, a laterally extending projection presenting an anti-disengagement shoulder facing the end of said strap length containing it, said anti-disengagement shoulder extending beyond an edge of a superposed protuberance and lying between said superposed protuberance and an adjacent portion of the strap length containing said superposed protuberance, said anti-disengagement shoulder further being substantially perpendicular to the side edges of the strap length and substantially parallel to the face of said one interlocking overlapping shoulder to inhibit separation and unlocking of said joints.

4,048,698

SEMIPERMANENTLY LOCKABLE SLIDER

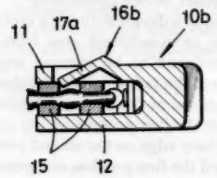
Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Dec. 17, 1975, Ser. No. 641,423

Claims priority, application Japan, Dec. 21, 1974, 49-155898[U]

Int. Cl.² A44G *19/30*

U.S. Cl. 24—205.14 R **1 Claim**



1. In a slider movable along interlockable rows of fastener elements of a slide fastener for closing the latter, wherein the slider includes a pair of upper and lower wings, a neck portion interconnecting the wings at their front ends to define a generally Y-shaped guide channel between the wings for guiding the interlockable rows of fastener elements therethrough, said upper wind including an aperture therethrough and a device for locking the slider in a closed position on the rows of fastener elements, said device consisting of a resilient locking pawl formed substantially integral with one of the wings of the slider and connected to an end edge of said aperture and having a distal end portion directed toward the rear end of said slider, said locking pawl being disposed centrally of said one wing and rearwardly of the neck portion, said locking pawl extending upwardly from its connection to said upper wing a slight amount having its distal end portion positioned at an acute angle to said one wing and intruding through said aperture into the guide channel to permit the distal end tip of said locking pawl to lockingly engage at least one fastener element within the guide channel in the closed position of the slider so as to lock the latter against movement in the fastener opening direction, said locking pawl being independently bendable relative to said one wing from a release configuration out of engagement with said fastener element within the guide channel to a fixed locking position of engagement with said fastener element, said distal end tip of the locking pawl being disposed for resilient engagement with said fastener elements and for sliding over said fastener elements during the fastener closing movement of the slider, when in said locking position the major portion of said locking pawl being disposed below the outward surface of said one wing to shield said locking pawl against movement toward said release configuration by forces acting above said outward surface of said one wing.

4,048,699

SLIDER FOR SLIDE FASTENER

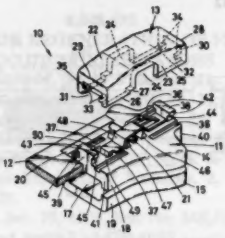
Yoshihiro Kanzaka, Nyuzen, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Dec. 31, 1975, Ser. No. 645,837

Claims priority, application Japan, Jan. 15, 1975, 50-6782

Int. Cl.² A44G *19/30*

U.S. Cl. 24—205.14 R **4 Claims**



1. A slider for a slide fastener comprising: a slider body including an upper and a lower shield and having a front and a rear end, said shields being connected together by a neck portion at the front end, said upper shield having a plurality of grooves therein extending longitudinally of the slider body; a pull tab having at one end a pintle pivotally connected to said upper shield; a pair of first engaging means provided at the front and rear ends lying along the longitudinal axis of said slider, respectively of said upper shield; a yoke of a caplike shape mounted on said upper shield and having an upper portion, a pair of longitudinal side walls and a pair of front and rear end walls, said side walls having cut-away recesses through which said pintle extends and providing separated bottom edges engageable in said grooves; and a pair of second engaging means provided at the front and rear end walls respectively, of said yoke and interfitting with said first engaging means, said yoke and upper shield being integrally bonded together along their respective engaging surfaces, said first engaging means including upwardly extending projections having laterally and outwardly extending members, said second engaging means also including laterally extending members that engage said laterally extending members of the first engaging means to establish a given positional relation between the yoke and upper shield, said laterally extending members of said first and second engaging means being located in spaced-apart relation to said longitudinally extending grooves.

4,048,700

CLAMP MEANS AND SUPPORT FOR SKIS, IN COMBINATION

Joseph N. Browne, c/o Esso Europe Inc., 5 Hanover Sq., London W1ROHQ, England

Filed Oct. 12, 1976, Ser. No. 731,124

Int. Cl.² B60R *9/12*

U.S. Cl. 280—11.37 K **6 Claims**

1. In combination:

A. a pair of skis, and

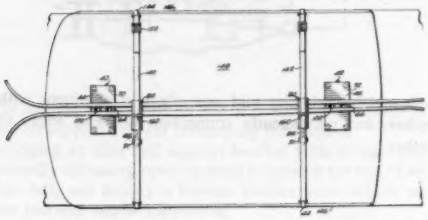
B. a support means for the skis for use as a car top ski carrier and as a work holder for holding the skis during a sharpening operation and during bottom repair of the same, comprising:

said pair of skis including, a first ski and a second ski, each ski having a congruent bottom with opposite longitudinally extending edge zones and said edge zones comprising metallic bottom edges,

said support means comprising a first and a second support, each including a rigid support base with a top surface having a planar zone and each support base having a bottom surface including downwardly extending friction means to engage a support surface, and each of said first in

means being of an overall height sized to locate the planar zone of the top surface at a predetermined common height above said support surface,

each of said supports including an upstanding portion extending medially of the planar zone and each upstanding portion having a top surface and including a first and a second vertical main side surface parallel to one another and at right angles to the planar zone and of an overall height which is less than the minimum distance between the longitudinally extending edges of the skis when the skis are in confronting relation with their respective bottom surfaces being mirror images of one another,



friction means on the top surface of each of said upstanding portions to engage a ski during bottom repair of same, and

U-shaped clamp means for clamping said upstanding portion between each of said pair of skis, each of said clamp means including a first leg and a second leg in spaced relation to one another joined by a base zone; said base zones of said clamp means each including an inside surface and an outside surface, and the outside surface includes a loop portion defining a pass through opening and strap means are included extending through the opening and having outwardly extending ends and hook means on the outwardly extending ends adopted to engage a gutter about the roof of an automobile.

4,048,701

DEFLECTION COMPENSATING ROLL

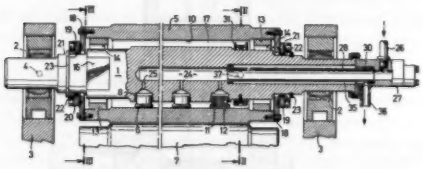
Ignazio Marchioro, Schio, Italy, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Nov. 3, 1976, Ser. No. 738,442

Claims priority, application Switzerland, Nov. 4, 1975, 14182/75

Int. Cl.² B21B *13/02*

U.S. Cl. 29—116 AD **22 Claims**



1. A deflection compensating roll which comprises a stationary support beam, a roll shell rotatably mounted about and defining with said beam an intermediate space therebetween, and at least one hydrostatic support element engaged between said beam and said shell for exerting a force against the interior of said shell, the end portion of each support element facing the interior of said shell having at least one fluid receiving recess formed therein and communicating with said intermediate space, said beam having an internal longitudinally extending chamber and means for sealing a first region of said chamber from a second region thereof, said first region of said chamber communicating with each fluid receiving recess and defining a conduit for supplying pressure fluid thereto, said second region of said chamber communicating with said intermediate space and defining a conduit for discharging from said intermediate space fluid flowing thereto from said recess.

4,048,702

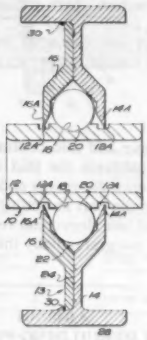
BALL BEARINGS

David Morris Garnett, Starra Cottage, Great Ouseburn, York, Yorkshire, England

Filed Apr. 6, 1976, Ser. No. 674,260

Int. Cl.² B21D *53/10*; B21K *1/02*

U.S. Cl. 29—148.4 A **5 Claims**



1. A method of constructing a ball bearing device which is composed of an inner race, ball bearings, and an outer race composed of two separate sections of plastics material, which method comprises:

a. snapping a first section of said outer race into a retained operative position around said inner race so that said first section can rotate freely about said inner race,

b. disposing said first section of said outer race in a generally horizontal plane and depositing in said horizontally disposed first section a plurality of balls so that said balls engage the race surfaces of said inner race and said first section of said outer race,

c. snapping the other outer race section into retained operative position around said inner race so that said other outer race section can rotate freely on said inner race, and thereby trapping said plurality of balls in a cavity jointly defined by said two sections of the outer race,

d. securing said two sectins of said outer race firmly together so that said two sections of said outer section are firmly in contact with the balls and free of contact with said inner race.

4,048,703

COLLAR SLEEVES AND PROCESS AND TOOL FOR THE MANUFACTURE THEREOF

Dieter Lehnhart, Mainz (Rhine), Germany, assignor to Glyco-Metall-Werke Daelen & Loos GmbH, Wiesbaden-Schierstein, Germany

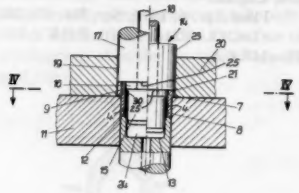
Filed Feb. 14, 1975, Ser. No. 549,953

Int. Cl.² B21D *53/10*

U.S. Cl. 29—149.5 DP **5 Claims**

1. A process for the manufacture of a collar sleeve consisting essentially of a relatively hard substrate having an inner surface coating of relatively softer bearing material, said process comprising the steps of preparing a cylindrical sleeve of said substrate having an inner surface coating **(4)** of bearing material except in a cylindrical region **(6)** at one end where the collar is to be formed; placing the said prepared sleeve in a radially confining cylindrical die recess **(12)** with the other end in axial abutment with a first die part **(13)** and with the said one end projecting above the recess into a coaxial cylindrical die bore **(19)** of larger diameter than said recess, providing another die part **(14)** extending through said die bore into said recess, said

other die part having a first cylindrical section (16) fitting slidably within said one end region of the sleeve and a second cylindrical section (15) extending through the remainder of said sleeve and an axially facing surface (25) above said sections in abutment with said one end of the sleeve; relatively axially moving said die parts together with upsetting pressure



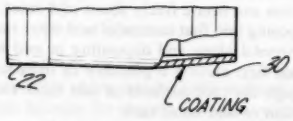
to shorten said sleeve and said coating simultaneously in the axial direction to calibrate the said sleeve and said coating between said confining die recess and said second cylindrical section of the other die part and to simultaneously increase in radial thickness said one sleeve end region within said coaxial die bore to form an integral radially thickened collar (7) on said one sleeve end.

4,048,704

METHOD FOR REBUILDING PINSETTER PULLEY ASSEMBLIES

Albert R. Trudeau, 545 Meadowdale, Ferndale, Mich. 48220

Filed June 11, 1976, Ser. No. 695,067
Int. Cl.[2] B23P *7/00*
U.S. Cl. 29—401 R **17 Claims**



1. A method of rebuilding pinsetter pulley assemblies of the type having a compound pulley face consisting of a convex surface and a flat surface, and having a worn convex surface only, said method including the steps of removing said worn convex surface, machining a new tapered surface in place of said convex surface, applying a heat resistant enamel coating to said tapered surface and curing said coating.

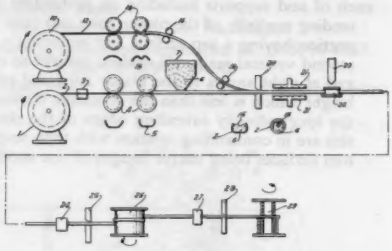
4,048,705

METHOD OF MAKING SOLDERING WIRE CONSTITUTED BY A CORE OF POWDER AND A METALLIC TUBE ENCLOSING THE CORE

Jacques Blanpain, Gentbrugge, and Leon Delehouzee, Wondelgem, both of Belgium, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED, Luxembourg, Luxembourg

Filed Apr. 29, 1975, Ser. No. 572,636
Claims priority, application France, May 22, 1974, 74.17830
Int. Cl.[2] B22F *3/24*
U.S. Cl. 29—420 **12 Claims**

1. A process of manufacturing a soldering wire constituted by a core of soldering powder and a tubular metallic member enclosing the core, said process comprising the steps of forming from a metal band an open channel of substantially U-shaped profile having a pair of lateral flanks with upper end edges extending longitudinally of the channel; introducing into the channel a stream of soldering powder to substantially fill the channel with a loose strand of said powder; covering the loose strand of powder introduced into the preformed channel by a sheath which surrounds at least part of the powder and which abuts with curved borders thereof against inner faces of said flanks to hold the powder at the bottom of the channel and to keep it away from said end edges of said flanks; closing said



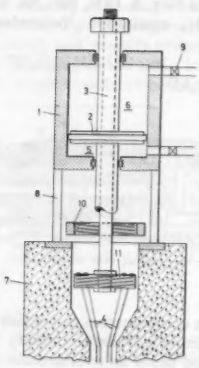
channel by bringing said end edges in abutment with each other; and permanently connecting said end edges to each other.

4,048,706

METHOD OF ELIMINATING AND UNEVEN STRESS DISTRIBUTION IN AN ELONGATED REINFORCED MEMBER

Birger Ludvigson, Sodra Vagen 38, Goteborg, Sweden (41256)

Filed Feb. 3, 1976, Ser. No. 654,988
Claims priority, application Sweden, Feb. 4, 1975, 7501229
Int. Cl.[2] E21B *19/00*
U.S. Cl. 29—452 **13 Claims**



1. A method of eliminating an uneven stress distribution in an elongated reinforcing member in a concrete structure caused by tensioning said member against a frictional resistance, comprising

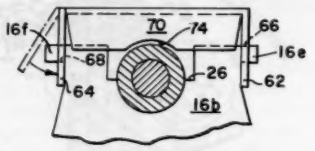
a. imposing about the desired amount of tensioning upon the member, and

b. thereafter suddenly subjecting the member to a measured amount of strain force change.

4,048,707
KEEPER FOR IDLER ROLLS

Ralph W. Coutant, Ridgewood, N.J., assignor to Litton Systems, Inc., Passaic, N.J.

Division of Ser. No. 446,009, Feb. 25, 1974, Pat. No. 3,934,711.
This application Oct. 8, 1975, Ser. No. 620,771
Int. Cl.[2] B21D *39/00*
U.S. Cl. 29—509 6 Claims



1. The method of securing an end of an idler roll in place in an idler roll support bracket comprising the steps of:

a. providing an idler roll support bracket with at least one upwardly extending opening sized to receive the end of an idler roll, and having a bottom surface upon which an idler roll end can be supported;

b. forming the idler roll support bracket with keeper support means raised above the level of said bottom surface and to each side of said idler roll support opening;

c. fabricating a keeper as a unitary member with a body and at least one leg from malleable metal that can take a set but so as to lock any significant resilience characteristics, said body of said keeper being sized to span said keeper support means;

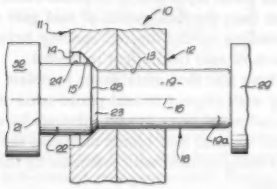
d. forming said leg and said support bracket with mutually co-operating lock means such that upon bending of said leg to a position at a predetermined angle with respect to said body said lock means secures said bracket and keeper together; and

e. bending said leg to said predetermined angle to lock said keeper and bracket together to secure an idler roll, when an end thereof is disposed in said opening, in place in said support bracket.

4,048,708
RIVETING METHOD EXPANDING A WORK COUNTERBORE

Franklin S. Briles, 1301 Dolphin, Corona del Mar, Calif. 92625

Filed May 17, 1976, Ser. No. 687,165
Int. Cl.[2] B21D *39/00;* B23P *11/00*
U.S. Cl. 29—509 10 Claims



1. In the method of securing a rivet slug to work containing a bore, a substantially cylindrical first counterbore that opens to one side of the work, and a second counterbore which is frusto-conical and tapers forwardly between the first counterbore and the bore, the steps that include,

a. inserting the slug to extend within the bore and counterbores, and

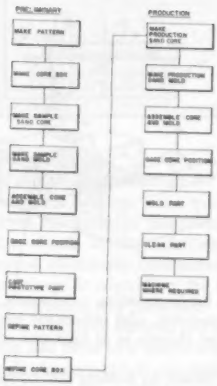
b. deforming the slug axially and radially to fill the bore and counterbores and to permanently expand the first counterbore, said deformation being carried out to radially expand that portion of the slug within the first counterbore to substantially greater extent than that portion of the slug within said bore,

c. the slug prior to said deformation having a shoulder axially facing the second counterbore, and said insertion step being carried out to locate said shoulder against the second counterbore, and to locate opposite ends of the slug projecting outwardly from opposite sides of the work, prior to said deformation.

4,048,709
METHOD OF CASTING

Howard H. Deem, Cincinnati, Ohio, assignor to Conval-Penn, Inc., McKeesport, Pa.

Filed Oct. 18, 1976, Ser. No. 733,201
Int. Cl.[2] B22C *9/02;* B22D *47/02*
U.S. Cl. 29—527.6 6 Claims



1. The method of sand casting a part having a smooth flat surface positioned within a predetermined tolerance, said method comprising the steps of:

1. making a pattern incorporating a shrink factor, said pattern being dimensioned to a lesser tolerance than said predetermined tolerance;

2. making a core box, said core box incorporating a shrink factor, said core box being dimensioned to a lesser tolerance than said predetermined tolerance;

3. making a sample core using said core box, said core being made of sand of predetermined characteristics and being made under regulated time and temperature conditions;

4. making a sample mold using said pattern, said mold being made of sand of predetermined characteristics and being made under regulated time and pressure conditions;

5. assembling said sample core within said sand mold and accurately positioning said core, gauging said core to determine that it is properly positioned within said mold;

6. pouring metal into said mold at a predetermined temperature to cast a prototype part and allowing said metal to cool for at least a predetermined time;

7. comparing the dimensions of said prototype part with the desired dimensions thereof;

8. modifying said core box and said pattern in any areas where the dimensions of said prototype part differ from the desired dimensions thereof;

9. producing production sand cores from said modified core box using sand having substantially the same characteristics utilized to produce the sample core and utilizing the same time and temperature conditions;

10. producing production sand molds using said modified pattern, said molds being made from sand having the same

characteristics utilized in producing the sample mold and utilizing the same time and pressure conditions;

11. assembling said production cores within said production molds and accurately positioning said cores within said molds, gauging said cores to determine that they are properly positioned to cast a production part;

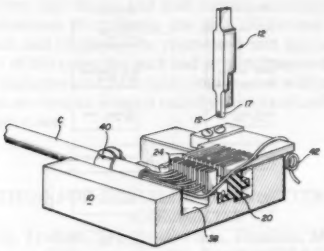
12. pouring metal into said mold at substantially the same temperature as used to cast the sample part and removing said production part from said mold after said predetermined cooling time.

4,048,710

CONDUCTOR TERMINATING APPARATUS

John Peter Nijman, West Hill, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Nov. 4, 1976, Ser. No. 738,645
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—566.4 **20 Claims**



1. Apparatus for terminating conductors in the contacts of an electrical connector, said connector having a plurality of contacts arranged therein in at least one row, said apparatus comprising:

a base having means for holding said connector in conductor receiving position;

a stationary comb element having comb teeth defining first conductor receiving slots alignable with said contacts of said connector;

a retractable comb element movable between open and closed positions and having comb teeth defining second conductor receiving slots alignable with said contacts of said connector, said retractable comb element in the closed position forming in cooperation with said stationary comb element a cross generally transverse to said conductor receiving slots;

stationary shear means positioned within each said second conductor receiving slot; and

an insertion tool having a transverse guide portion for sliding within said cross slot and longitudinal blade means for inserting a conductor threaded through said comb elements into one of said contacts, said blade means also having an edge which cooperates with said stationary shear means to trim the conductor immediately prior to insertion into a contact of said connector.

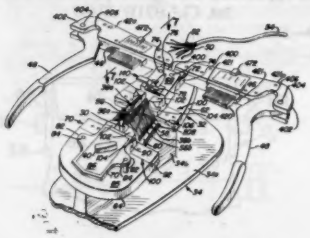
4,048,711

WIRE INSERTION APPARATUS

Freidrich A. Haller, Chicago, Ill., assignor to TRW Inc., Elk Grove Village, Ill.

Filed Feb. 13, 1975, Ser. No. 549,714
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—566.3 **27 Claims**

1. Apparatus for terminating wires in terminals of a connector, comprising a frame, connector carriage means on said frame for supporting such a connector, means for aligning wires with such terminals of a connector supported on said connector carriage means, and insertion means comprising a first member mounted on said frame for pivotal movement into insertion engagement with a connector supported on said connector carriage means and including insertion rams for forcing aligned wires from said aligning means into said terminals of such a connector upon such engagement, said connector carriage means comprising first and second side members



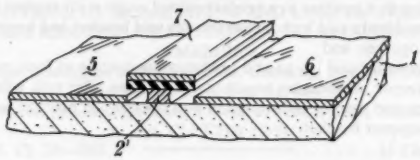
and a connector support member, all of said first and second side members and said connector support member being laterally translatable on said frame, generally parallel to the direction of and in response to said movement of said first member at insertion, within predetermined limits.

4,048,712

PROCESSES FOR MANUFACTURING SEMICONDUCTOR DEVICES

Marina Buiatti, Rome, Italy, assignor to SELENIA-Industrie Elettroniche Associate S.p.A., Italy

Filed Dec. 1, 1975, Ser. No. 636,468
Claims priority, application Italy, Aug. 8, 1975, 50889/75
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **4 Claims**



1. A process of manufacturing a field effect transistor having a Schottky barrier gate electrode, comprising the steps of

providing a substrate of semiconductor material,

depositing on the exposed surface of said substrate a first metal layer, a part of which will form the Schottky junction gate electrode,

applying on said metal layer a strip of photo-resist having a width greater than the final width of said gate electrode and corresponding to the desired spacing between two ohmic contacts of said field effect transistor,

chemically etching said first metal layer to obtain a desired underetching with respect to said photo-resist strip,

applying a second metal layer to said substrate by an evaporation process to form said ohmic contacts, the edges of said contacts being defined with precision by the edges of said resist strip,

and removing said photo-resist strip from said gate electrode and alloying said ohmic contacts.

4,048,713

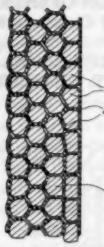
METHOD OF MAKING COMPACT ELECTRIC COILS

Mogens Hvass, Damagerveg 5, Stilling 8660 Skanderborg, Denmark

Filed June 9, 1975, Ser. No. 584,862
Int. Cl.[2] H01F *41/04*; H04R *31/00*
U.S. Cl. 29—594 **8 Claims**

1. A method of producing compact electric coils having a

high space factor, such as voice coils for loudspeakers, whereby the coil is wound in winding layers of insulated wire of round cross sectional shape, characterized in that the method comprises the steps of arranging a coil on a mandrel filling out the coil, subjecting the mandrel and coil to a differ-



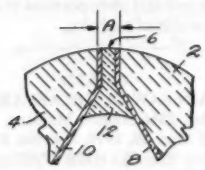
ential thermal treatment to cause, without a counter pressure being exerted on the wire, a radial compression of the wire until the wire in each winding layer becomes deformed at surface portions thereof so as to be pressed substantially flat against the surfaces of the adjoining wire portions of the adjacent winding layers.

4,048,714

GLASS BONDING OF MANGANESE-ZINC FERRITE

Robert L. Huntt, 25007 Woodfield Road, Damascus, Md. 20750

Continuation of Ser. No. 586,345, June 12, 1975, abandoned.
This application June 21, 1976, Ser. No. 697,842
Int. Cl.² G11B *5/42*
U.S. Cl. 29—603 **9 Claims**



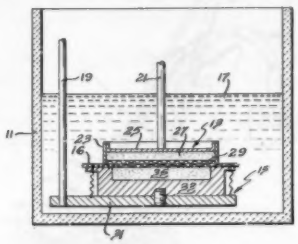
1. A process for increasing the wear resistance of a magnetic recording/reproducing head, said head comprising a core of magnetic hot-pressed manganese-zinc ferrite material having opposing pole faces defining at least one gap, while also minimizing or eliminating reaction between the manganese-zinc ferrite pole faces and a glass bonding composition applied thereto, said process comprising first forming a layer of chromium on the pole faces by R.F. sputtering the chromium thereon, each chromium layer being of a thickness of at least 25% of the width of said gap, and thereafter glass bonding the resulting chromium layers together by applying a high lead glass bonding composition at least 3 microinches thick to the area of the gap and firing the glass bonding agent at a temperatuer of no greater than about 700° C to adhere to chromium layers together with the glass bonding agent.

4,048,715

METHOD OF PREPARING POROUS, ACTIVE MATERIAL FOR USE IN ELECTRODES OF SECONDARY ELECTROCHEMICAL CELLS

Donald R. Vissers, Naperville; Paul A. Nelson, Wheaton; Thomas D. Kaun, Lisle, and Zygmunt Tomczuk, Palos Hills, all of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 27, 1976, Ser. No. 652,696
Int. Cl.² H01M *6/00*
U.S. Cl. 29—623.5 **3 Claims**



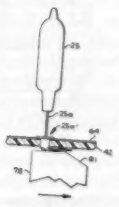
1. In a method of preparing an electrode for use in a secondary electrochemical cell wherein solid particulate active material selected from the group of transition metal sulfides consisting of sulfides of iron, cobalt, nickel and copper is vibratorily loaded into an electrically conductive, foamed-solid substrate, the improvement in controlling the loading of said substrate comprising blending said particulate active material with thermosetting carbonaceous material and solid volatile to form a paste; heating said paste to a temperature sufficient to transform said volatile to vapor and to cure said thermosetting carbonaceous material into a porous solid matrix; comminuting said matrix into porous particles of carbonaceous material containing embedded active material; and vibratorily loading said particles into said electrically conductive foamed-solid substrate for use as an electrode within a secondary electrochemical cell.

4,048,716

METHOD OF MAKING ELECTRICAL CONNECTIONS

Roger F. Jehlicka, Highland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 9, 1976, Ser. No. 675,106
Int. Cl.² H01R *43/04, 9/14, 9/20*
U.S. Cl. 29—628 **12 Claims**



1. A method of connecting an elongated electrical conductive member to a conductor carried by an electrically insulative member, comprising the steps of providing an opening through said insulative member at said conductor, placing an eyelet through said opening so as to make contact with said connector and so that the shank of the eyelet extends from the insulative member, inserting said elongated conductive member into said eyelet, and bending the entire end region of the

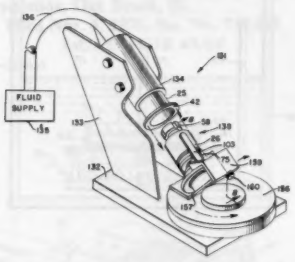
extending shank of the eyelet sufficiently sideways so as to hold the conductive member and secure the eyelet in position.

4,048,717

APPARATUS FOR ASSEMBLING AN ENCAPSULATED WET MOTOR CIRCULATOR

Leonard A. Piette, Warwick, R.I., assignor to Unipas, Inc., Warwick, R.I.

Division of Ser. No. 681,736, April 29, 1976, Pat. No. 4,023,261.
This application Oct. 19, 1976, Ser. No. 733,758
Int. Cl.[2] H02K *15/14*
U.S. Cl. 29—732 **4 Claims**



1. An apparatus for assembling a subcombination of components for use in a circulator, said subcombination comprising at least a sleeve, a rotor secured to a shaft, a first bearing support member and a second bearing support member, each of said bearing support members including support bearings for receiving said shaft, the apparatus comprising:

means for retaining a curing fixture which in turn supports said rotor and said first and said second bearing support members about said shaft and said rotor in a linear array on an axis; and

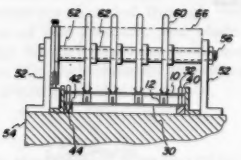
means for ejecting said sleeve upon command, said ejecting means including means for retaining said sleeve in alignment with said axis so that upon command said sleeve is forceably ejected onto said component subassembly.

4,048,718

PIN CRIMPING APPARATUS AND PRODUCT THEREFROM

Everett Arthur Rote, Clay Canyon Camp, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 26, 1975, Ser. No. 635,549
Int. Cl.[2] H05K *1/10, 3/30*
U.S. Cl. 29—739 **2 Claims**



1. A machine for crimping pins of card holders extending through apertures in a printed circuit mother board including:

movable support means for supporting the mother board with the pins, through apertures in the mother board, of a card holder extending upwardly in vertical rows,

crimping wheels operatively positioned with the support means to contact the pins and outwardly deform the card holder pins when they are moved into contact and past said wheels, and

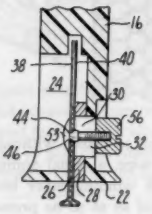
means to move said support means and supported mother boards past said wheels so that when the mother boards and pins means are contacted by and moved past said crimp wheels they will be deformed outwardly to render the pins and card holders relatively secure for presentation to a solder wave.

4,048,719

CARTON OPENER

Mary Kay Thompson, 6740 Commerce Road, Orchard Lake, Mich. 48033

Filed Feb. 17, 1976, Ser. No. 658,679
Int. Cl.[2] B67B *7/30;* **B26B** *5/00*
U.S. Cl. 30—2 **6 Claims**



1. A hand-held device for opening cartons comprising:

a handle having a lower flat surface,

a cutting blade secured to said handle and extending outwardly and downwardly from said flat surface, said cutting blade having a forwardly facing cutting edge and a lower, outwardly extending edge, wherein said cutting edge is adapted to cut a carton as said handle is moved in a forward direction,

a guard secured across the lower, outwardly extending edge of said cutting blade and substantially perpendicular thereto, said guard including a portion extending forwardly of said cutting edge and forming a slot between said lower flat surface of said handle and said forwardly extending portion of said guard,

a pair of facing and vertically elongated plate portions, said plate portions being secured at their lower ends to said guard and adapted to lockingly receive the cutting blade therebetween, said plate portions being slidably received through a longitudinal slot formed in the bottom surface of said handle, and

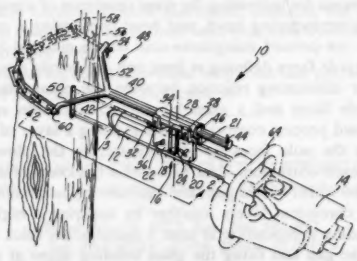
means for simultaneously vertically adjustably locking said cutting blade and said plate portions to said handle and for varying the width of said slot.

4,048,720

CHAIN SAW GUIDE APPARATUS

Charles J. Wheeler, 2346 Haines, Madison, Ohio 44057

Filed Mar. 29, 1976, Ser. No. 671,281
Int. Cl.[2] B27B *17/02*
U.S. Cl. 30—166 A **16 Claims**



1. A guide apparatus attachment for guiding movement of a

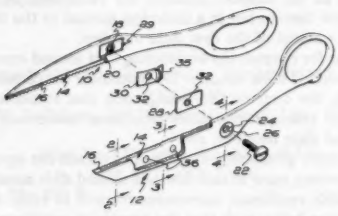
portable hand-held chain saw having a bar having a chain guide surface extending around the edge thereof which defines a plane and a pair of planer parallel side surfaces disposed parallel to and one on each side of said plane in which the chain guide surface extends, the guide apparatus being adapted to guide movement of the chain saw in a direction substantially parallel to the longitudinal axis of the bar of the saw through a member disposed contiguous to the guide apparatus attachment comprising a guide member disposable contiguous to a member to be cut and having a guide surface thereon disposed substantially parallel to the axis of a hole to be cut in the member by the chain saw and substantially parallel to the longitudinal axis of the bar of the chain saw, said guide member and guide surface being disposed in the plane defined by the chain guide surface on the bar of the saw, guide means engaging said guide surface, said guide surface guiding relative movement of said guide member and said guide means in a direction substantially parallel to the longitudinal axis of the bar of the chain saw and support means rigidly supportable by the bar of the chain saw for supporting said guide means in engagement with said guide surface of said guide member to enable said guide member to guide movement of said guide means and the chain saw in a direction parallel to said guide surface to enable the chain saw to cut a hole in the member disposed contiguous to said guide member wherein the hole has an axis substantially parallel to the longitudinal axis of the bar of the chain saw and substantially parallel to said guide surface.

4,048,721

SCISSORS

Brennand Gunson, Sheffield, England, assignor to Russell (Shears) Limited, Rawmarsh, near Rotherham, England

Filed Sept. 10, 1976, Ser. No. 721,939
Int. Cl.² B26B *13/02*
U.S. Cl. 30—254 **5 Claims**



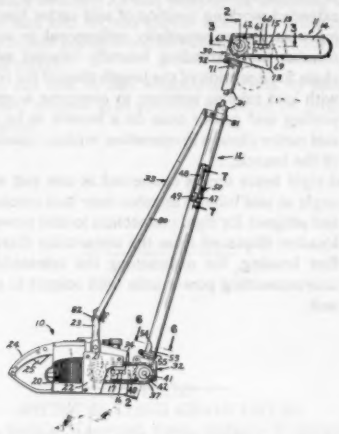
1. A pair of scissors having a pair of pivotally connected blades; each blade being made of a moulded plastics material with an integrally moulded-in metal cutting element so that only the marginal edge portions of said cutting elements are visible, the marginal edge portion of each cutting element being angled out of the plane of the remainder of such element and the depth of the angled portion decreasing from the extreme end of the blade to a point at which it runs out in the region of the pivot connecting the blades, the angled portion of each cutting element being an angle of up to 90° to the plane containing the remainder of the cutting element; the metal cutting elements each being provided with at least one aperture for the flow of moulding material therethrough; the moulded material having flowed through said apertures of the cutting elements during the molding step to unite the moulded parts of the blades on opposite sides of the cutting elements by bridges of molded plastics material integral therewith and to thereby form blades of substantially sandwich construction.

4,048,722

CHAIN SAW ATTACHMENT

Byron W. Howard, Hot Springs, Mont. 59845

Filed June 28, 1976, Ser. No. 700,178
Int. Cl.² B27B *17/08*
U.S. Cl. 30—386 **2 Claims**



1. In combination with a chain saw, having a power unit including a first driving sprocket wheel, a cutter head including an endless cutter chain for directly engaging said first driving sprocket wheel, and means removably mounting said cutter head on said power unit so that said cutter chain extends from said power unit in a predetermined direction,

a rigid elongated interconnecting power train for interposition between said power unit and said cutter head to provide an extended working position for said cutter head relative to said power unit, said power train comprising an elongated rigid tubular member;

a power shaft in two longitudinally separable parts traversing said tubular member and carried in bearings in the ends thereof for rotating therein about an axis;

means at one end of said tubular member for connecting said tubular member to said power unit for drive and support thereby, including a first housing configured for supportive connection to said power unit instead of said cutter head, means connecting said first housing to said tubular member and preventing relative rotation therebetween about the axis of said power shaft, a first stub shaft projecting from said first housing in a direction orthogonal to said axis and carried in bearings in said first housing, a driving connection in said first housing from said first stub shaft to said power shaft, a driven sprocket wheel carried on said first stub shaft outside said first housing for alignment with said first driving sprocket wheel, and an endless driving chain for conducting power from said first driving sprocket wheel to said first driven sprocket wheel;

means at the other end of said cutter head for connecting said tubular member to said cutter head for drive and support thereof instead of said power unit, including a second housing configured for supportive connection of said cutter head, means connecting said second housing to said tubular member and preventing relative rotation therebetween about said axis of said power shaft, a second stub shaft projecting from said second housing in a direction orthogonal to said axis and carried in bearings in said second housing, a driving connection in said second housing from said power shaft to said second stub shaft, and a second driving sprocket wheel carried on said second stub shaft outside said second housing for alignment with said cutter chain, said first and second housing being so oriented with respect to

said tubular member that when said interconnecting power train is interposed between said power unit and said cutter head, said endless cutter chain has the same general direction as said endless drive chain, and said axis of said power shaft is skewed at large acute angles with respect thereto, said second housing further including a nose located beside said cutter chain in the extended working position of said cutter head and having a surface substantially orthogonal to said tubular member and extending laterally beyond said cutting chain for a portion of the length thereof for cooperation with said tubular member to comprise a rest for supporting said power train on a branch to be cut, while said cutter chain is in operation, without causing cutting of the branch;

and rigid brace means connected at one end at an acute angle to said tubular member near said second housing, and adapted for rigid connection to said power unit at a location displaced from the connection thereto of said first housing, for maintaining the orientation of said interconnecting power train with respect to said power unit.

4,048,723

DENTAL EXPLORER

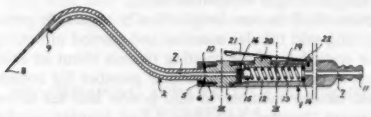
Palle Thorup, 20, Odensevej, 5750 Ringe, Denmark

Filed Sept. 15, 1975, Ser. No. 613,293

Claims priority, application United Kingdom, Sept. 14, 1974, 40139/74; Denmark, Aug. 20, 1975, 3744/75

Int. Cl.² A61C *3/00*

U.S. Cl. 32—40 R **12 Claims**



1. In a dental explorer assembly for use in dentistry, the explorer including a handle or butt portion and a generally tapered explorer portion terminating in a point which is to be brought into contact with surfaces of teeth of a patient, the improvement comprising a passage having a first orifice and a second orifice, said passage extending at least partially through said handle or butt portion with said first orifice spaced from and directed toward said point for directing a stream of compressed air onto surface of a tooth adjacent said point to blow away chips and maintain this surface dry; a compressed-air source; a light and flexible connection connected between said second orifice of said passage and said compressed air source for feeding compressed air to said passage; at least one valve arranged in said handle or butt portion between said compressed-air source and said first orifice for selectively allowing compressed air to flow through said passage under control of one using the assembly, said valve including a valve seat arranged in axial symmetry in said handle or butt portion and having (1) an axial bore and generally concave seat surface and (2) a valve body in axial position when said valve is closed and having a convex valve surface whose convexity is greater than concavity of said seat surface of said valve seat; means for resiliently urging said valve surface against said seat surface; and finger-operable means for causing displacement of said valve body away from its axial closed position.

4,048,724

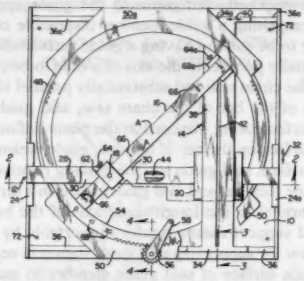
ELLIPSOGRAPH

Paul H. Keuver, 8357 Woodlawn, San Gabriel, Calif. 91775

Filed Apr. 12, 1976, Ser. No. 675,928

Int. Cl.² B43L *11/04*

U.S. Cl. 33—31 **9 Claims**



1. An ellipsograph comprising;

a. a support member adapted to be disposed adjacent a surface on which an ellipse is to be generated,

b. a crank pin actuating member and means for supporting same on the support member for rotation about a fixed axis, said actuating member defining a rotatable reference axis intersecting the fixed axis normal thereto,

c. first and second rotatable crank pins and means for individually adjusting same to desired fixed positions along said reference axis of the actuating member,

d. a first slide member and means for slideably connecting same to the support member for rectilinear movement relative thereto,

e. means for operatively connecting said first crank pin to said first slide member for rectilinear movement therealong, the construction being such that rotation of said first crank pin translates rectilinear movement to said first slide member,

f. a second slide member and means for slideably connecting same to the support member for rectilinear movement relative thereto but in a direction normal to the direction of movement of the first slide member,

g. means for operatively connecting said second crankpin to said second slide member for rectilinear movement therealong, the construction being such that rotation of said second crankpin translates rectilinear movement to said second slide member, and

h. an ellipse generating member and means for operatively connecting same to said first and second slide members for slideable rectilinear movement relative to both, the construction being such that the combined rectilinear movements of the first and second slide members is resolved into elliptical motion imparted to the ellipse generating member.

4,048,725

FEED INDEX DEVICE IN UNIVERSAL PARALLEL RULER OR THE LIKE

Masao Koenuma, and Yoshitaka Gibu, both of Tokyo, Japan, assignors to Asahi Seimitsu Kabu Shiki Kaisha, Oizumi, Japan

Filed Feb. 5, 1976, Ser. No. 655,599

Int. Cl.² B43L *13/24*

U.S. Cl. 33—81 **11 Claims**

1. A straightedge movement control mechanism for use in a universal parallel ruler or the like to provide incremental movement of a straightedge over a drawing surface, said mechanism comprising:

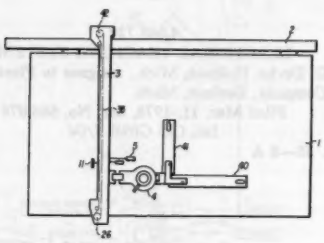
a track means for guiding a straightedge;

a movable carriage plate including said straight-edge, said

carriage plate being mounted on, and movable along, said track means;

a control member mounted on said track means for reciprocal motion between an initial position and an end position;

a linkage means coupled between said movable carriage plate and said control member for transmitting movement of said movable carriage plate along said track to said control member to thereby move said control member from said initial position to said end position, said linkage means including a clutch mechanism for disengaging said linkage means to allow said control member to move independently of said movable carriage plate back to said initial position;



a stop member mounted on said track means located at one of said initial and end positions to stop the movement of said control member thereat;

an adjustable means located at the other of said initial and end positions to stop the movement of said control member thereat; and,

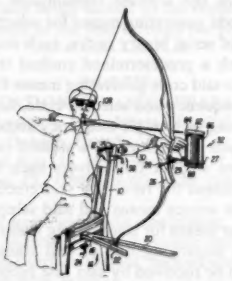
operating means linked to said movable carriage plate for allowing movement of said movable carriage plate and linked to said clutch mechanism for engaging said clutch mechanism when said operating means is activated to move said carriage plate and said coupled control member from said initial position to said end position, but disengaging said clutch mechanism when said operating means is deactivated.

4,048,726

APPARATUS FOR SIGHTING A PROJECTILE FIRING WEAPON

Albert W. LeFebvre, 11½ Wilmington Road, Lake Placid, N.Y. 12946

Filed Dec. 10, 1975, Ser. No. 639,530
Int. Cl.² G08B *21/00*
U.S. Cl. 33—180 R **10 Claims**



1. Apparatus for sighting a manually supported projectile firing weapon at a target comprising:

a support element fixed with respect to said target;

first means mounted on said support element for producing a first signal sensible to a person using said weapon when said weapon is oriented for firing at a pre-selected elevation;

second means mounted on said support element for producing a second signal sensible to a person using said weapon when said weapon is oriented for firing at a pre-selected azimuth;

third means mounted on said weapon for acutating said first means and said second means when said weapon is oriented at said pre-selected elevation and azimuth for firing at said target,

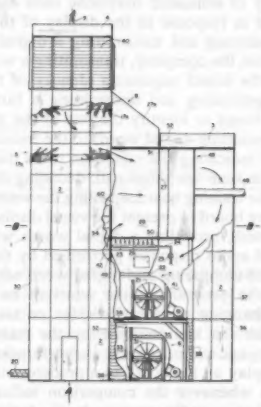
whereby the user of said weapon is alerted by said signals that said weapon is in position for firing its projectile at said target.

4,048,727

RECIRCULATING GRAIN DRYER

Walter Y. Botkins, Leawood, Kans., assignor to Berico Industries, Inc., Shawnee Mission, Kans.

Filed Apr. 14, 1976, Ser. No. 677,053
Int. Cl.² F26B *7/00*
U.S. Cl. 34—13 **17 Claims**



1. A process for drying granular material comprising:

a. feeding a moisture-ladened material to a heating zone and drying same therein by contact with a heating gas that is passed through the heating zone and into a gas flow space open to the atmosphere, and passing a portion of said heating gas to the atmosphere from said gas flow space without passing through said heating zone,

b. thereafter feeding the heated granular material into a cooling zone and cooling same therein by contact with a cooling gas that is passed through the cooling zone into said gas flow space,

c. supplying said cooling gas to the cooling zone at a pressure greater than atmospheric pressure,

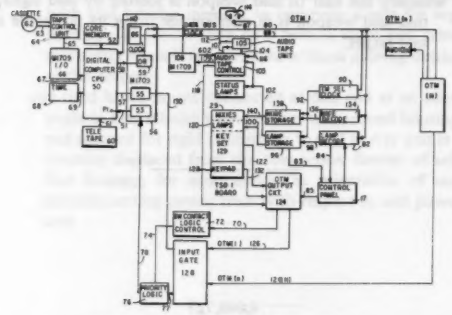
d. mixing said heating gas and cooling gas within said gas flow space after passage through said respective zones, and

e. feeding said mixed heating and cooling gases through said heating zone.

4,048,728
TRAINING SYSTEM FOR TELEPHONE SWITCHBOARD OPERATORS USING COMPUTER CENTRAL PROCESSING UNIT

George F. Nason, III, Indialantic, and Walter W. Winter, Melbourne, both of Fla., assignors to Systex, Inc., Melbourne, Fla.

Continuation of Ser. No. 396,620, Sept. 12, 1973, abandoned.
This application Dec. 3, 1975, Ser. No. 637,136
Int. Cl.[2] G09B 9/00
U.S. Cl. 35—8 A 33 Claims



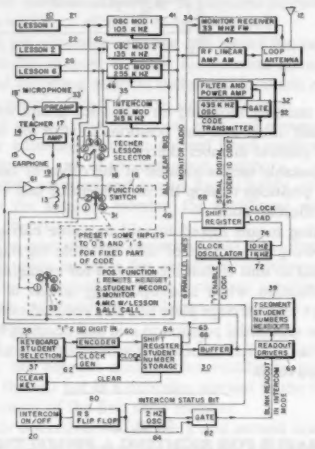
17. A method of training a telephone switchboard trainee with a training board having a visual display means and keys arranged in a pattern similar to the telephone switchboard for which training is required comprising the steps of providing a stored program in a computer which indicate the different switchboard conditions to be displayed for successive steps of a plurality of simulated telephone calls and the steps to be performed in response to the display of the different conditions, generating and transmitting a digital word requesting service from the computer, transmitting a word from the computer to the board requesting identity of the telephone call desired, generating and transmitting a further digital word from the board to identify the one of the telephone calls desired, transmitting digital words to the training board from the computer indicating the condition to be displayed for one of the steps in such telephone call, decoding the received digital word at the training board, enabling the visual display means at the training board to present the visual display identified by the digital words, providing a digital words which identifies the keyed and audio responses performed by the trainee for such display and comparing said digital word with the digital word identified in program as the word to be provided by the trainee, changing the visual display on said board in accordance with the key response by the trainee whenever the proper key and audio response are performed, and resetting the visual display on the board to a predetermined earlier display condition whenever the comparison indicates an error in a required key or audio response by the trainee.

21. In a training device for use in the training of a trainee in the operation of a telephone switchboard, at least one training position including visual display means and a set of keys, source means including means for providing coded words for said position to simulate the conditions for successive steps of a call, data means for transmitting said coded words to said one position, decoder means in said one position for detecting and decoding the words input thereto from said data means, means at said one position for controlling the presentation of the visual display which is identified by the words which are decoded by its decoding means, words format means responsive to the operation of one of said key means by a trainee to generate an output word which identifies the operated one of said keys, voice detection means for detecting audio responses of the trainee and for providing a signal to said word format means to effect generation of an output word with detection of a voice reponse by the trainee, decision means in said source means for comparing each word which identifies the operated key with the key response required by a preselected program and for verifying the receipt of the voice response, and input means for inputting said words which identify the operated one of the keys and the voice response to said decision means in overlapping time periods and sequences.

4,048,729
ELECTRICAL TEACHING SYSTEM

Harry G. Derks, Holland, Mich., assignor to Fleetwood Furniture Company, Zeeland, Mich.

Filed Mar. 11, 1976, Ser. No. 666,076
Int. Cl.[2] G09B 5/04
U.S. Cl. 35—8 A 17 Claims



1. A wireless electrical teaching system comprising:

a central console including lesson source means for providing electrical signals representative of a lesson including audio information to be transmitted, transmitter means coupled to said lesson source means for transmitting said electrical signals, said transmitting means including an antenna for the wireless transmission of said electrical signals; code generating means for selectively providing a plurality of serial binary codes, each code uniquely associated with a predetermined student transceiver, means coupled to said code generating means for transmitting on a single frequency and selected code, first receiver means for receiving on a single frequency audio modulated electrical signals transmitted by a student transceiver; and

a plurality of student transceivers each including student receiver means for receiving said electrical signals from said lesson source means and said selected code, student transmitter means for transmitting audio information from a student employing one of said transceivers on a frequency to be received by said first receiver means of said central console, and decoder means coupled to said student receiver means and responsive to a predetermined code to actuate said student transmitter means such that an instructor can monitor information generated by a student by actuating said code generating means to effect transmission of a code associated with a selected student.

4,048,730

LIGHT BEAM DEFLECTION MEANS PARTICULARLY FOR RANGE COMPENSATION IN WEAPONS TRAINING AIDS

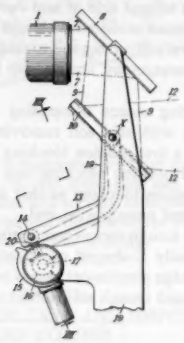
Michael John Edwards, Godalming, England, assignor to RFD Systems Engineering Limited, Great Britain

Filed Dec. 11, 1975, Ser. No. 639,919

Claims priority, application United Kingdom, June 24, 1975, 26784/75

Int. Cl.² F41G *3/26*

U.S. Cl. 35—25 **7 Claims**



2. In a gunnery training aid comprising a projector and means for moving a film through the projector, a screen onto which a beam of light emanating from the projector may be projected to form a moving image serving as a target at an apparent range, and synchronizing means for stopping movement of the film through the projector when a bullet is fired from a gun at the moving image, the improvement comprising light beam deflection means in the projector for altering the angle of inclination of the beam to a selected value which compensates for the drop in trajectory of the bullet which would have occurred at the apparent range, the light beam deflection means comprising a pivotally mounted mirror positioned to reflect the beam of light, a cam movable to a position dependent upon the selected inclination, a cam follower engageable with the cam, linkage means interconnecting the cam follower and the mirror, and a stop movable under the control of the synchronizing means between an operative extended position in which the stop acts to retain the mirror in a datum position irrespective of the position of the cam corresponding to a datum inclination of the beam, and a retracted position in which the cam follower engages the cam in such a manner that the mirror occupies a pivotal position which reflects the beam of light at the selected inclination, the stop occupying the operative position during the projection of the moving image onto the screen and being moved to the retracted position on stopping movement of the film through the projector.

4,048,731

EDUCATIONAL GAME APPARATUS

Anastasia Baguioro, c/o Lady Minto Hospital, Box 4000, 8th St., Cochrane, Ontario, Canada

Filed Aug. 24, 1976, Ser. No. 717,218

Int. Cl.² G09B *19/00*; A63F *7/02*

U.S. Cl. 35—30 **5 Claims**

1. Educational game apparatus comprising:

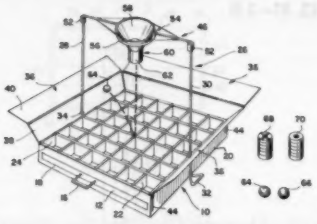
a gameboard provided with a square array of adjacent squares on one surface thereof, each adjacent square being distinguished from another;

a box including a slot in the front surface thereof slidably receiving said gameboard, in a substantially horizontal plane, said box having a plurality of criss-crossed upright partitions forming square holes positioned above each of the squares on said gameboard;

a funnel;

means supporting said funnel on said box above the intersection of the central ones of said partitions;

a pair of balls each of which corresponds to one of the distinguished adjacent squares on said gameboard adapted to be thrown through said funnel to bounce along the



upper edges of said partitions and come to rest in one of said square holes above one of the squares of said gameboard; and

a disc having a marking corresponding to either of said balls adapted to be positioned on the gameboard on the square on which said corresponding ball comes to rest.

4,048,732

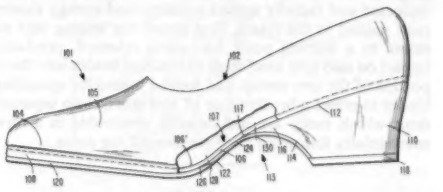
SHOE AND METHOD OF MAKING THE SAME

Nathan Stix, Cincinnati, Ohio, assignor to The United States Shoe Corporation, Cincinnati, Ohio

Filed Mar. 11, 1976, Ser. No. 665,832

Int. Cl.² A43B *21/00*; A43D *9/00*

U.S. Cl. 36—34 B **8 Claims**



1. An improved shoe construction having a forepart of slip last construction and having a waist portion and a heel portion of cement construction, said waist portion being without reinforcement to provide substantial flexibility between the forepart and heel portions of the shoe, the improvement comprising:

a shoe upper;

a substantially flexible insole extending the length of the shoe and secured to said upper;

a wedge heel attached to the rear portion of said insole, said wedge heel having a tapering forward portion extending along at least a part of the central portion of said insole to provide support for the waist portion of said shoe;

an outsole underlying the forepart of the shoe and attached to the forward portion of said insole;

a wedge tunnel cover attached to the front face of said wedge heel and extending forwardly therefrom to cover the waist portion of said insole between said heel and said outsole, said outsole covering the front edge of said wedge tunnel cover; and

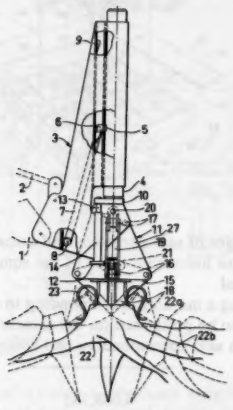
means securing said outsole to said tunnel cover and to said insole and for securing said tunnel cover to said forward portion of said wedge heel and said insole to provide a flexible shoe which provides adequate foot support without utilizing a stiff shank or shank reinforcement.

4,048,733

DEVICE FOR USE IN REMOVAL OF STUMPS

Erik Torsten Forslund, Alfta, Sweden, assignor to Ostbergs Fabriks AB, Alfta, Sweden

Filed Sept. 30, 1976, Ser. No. 728,286
Claims priority, application Sweden, Oct. 1, 1975, 7511007
Int. Cl.[2] A01B *13/00*
U.S. Cl. 37—2 R 7 Claims



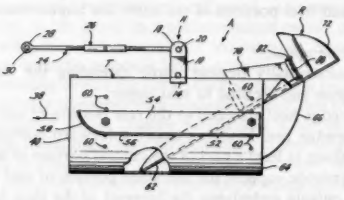
1. A device for use in removal of tree stumps, comprising a vehicle-carried crane arm, a vertically extending frame supported at the end of said crane arm, a split head mounted at the lower end of said frme for limited vertical movement, chopping blades mounted at said split head and movable between a collected and radially spread position, and energy storer, as a ram, guided in the frame, first means for raising said energy storer to a starting point for, when released, producing an impact on said split head so as to sink said blades into the centre portion of the tree stump, and second means for spreading said blades to effect a breaking-up of said stump into separate portions which easily are individually removable in a direction substantially following the extension of the roots.

4,048,734

DITCH DIGGING APPARATUS

Erwin D. Carpenter, Rte. 1, Box 423, Alvin, Tex. 77511

Filed Apr. 28, 1976, Ser. No. 681,053
Int. Cl.[2] E02F *5/02*
U.S. Cl. 37—98 1 Claim



1. An excavating implement adapted to be pulled by a vehicle, comprising:

cutting trough means for cutting through soil;

soil removing means mounted with and extending into said trough means for receiving soil from said trough means and forming a passageway for soil to pass laterally beyond said trough means;

hitch means mounted with said trough means for connecting said trough means to a vehicle;

depth control means for controlling the depth at which said cutting trough means cuts through soil comprising skid means mounted with said cutting trough means for supporting said cutting trough means at a desired depth in the soil;

mounting means for mounting said skid means with said cutting trough means in any of a plurality of selected positions to control the depth in the soil at which said skid means supports said cutting trough means;

said soil removing means forming a first passageway for soil to pass laterally beyond a first side of said cutting trough means and a second passageway for soil to pass laterally beyond a second side of said cutting trough means;

diverting means mounted with said soil removing means for alternatively diverting soil to said first passageway, to said second passageway, and to both first and second passageways;

said diverting means comprising a baffle plate pivotally mounted with said soil removing means for movement between a first position blocking said second passageway, a second position blocking said first passageway, and a third position blocking neither said first passageway nor said second passageway; and

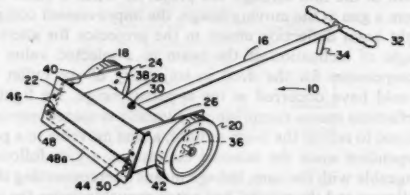
the cutting trough means comprising trough means having a substantially U-shaped cross-sectional configuration and cutting edge attachment means mounted with the forward edge of said trough means for cutting through soil.

4,048,735

MULTI-PURPOSE LABOR-SAVER WHEELED TOOL

Fred Brunty, Rte. 1, Box 403-140, Bluefield, W. Va. 24701

Filed Feb. 3, 1976, Ser. No. 654,860
Int. Cl.[2] E02H *5/02*; B62D *51/04*
U.S. Cl. 37—130 14 Claims



1. A multi-purpose wheeled tool comprising: a body having: a laterally spaced pair of side plates, a rearwardly extending center plate fixed between the side plates, a generally upright front plate fixed transversely across and in front of the center-plate and side plates, a pair of wheels, means for rotatively mounting each wheel rearwardly in a respective side plate in height adjustable relation thereto, a handle, means fixing the handle in straight relation along and rearwardly protrusive from, the center plate, a plurality of accessory members for use in turn in material working and the like in combination with the body, and means including plural laterally spaced attachment means for detachably attaching in turn the plurality of accessor members to the body.

4,048,736

LAMINATED COMPOSITE SHEET PACKAGING MATERIAL

Howard H. Castleman, Charlotte, and Henry G. Stewart, Harrisburg, both of N.C., assignors to Package Products Company, Inc., Charlotte, N.C.

Filed Feb. 11, 1975, Ser. No. 548,895
Int. Cl.[2] A44C *3/00*
U.S. Cl. 40—2 R 19 Claims

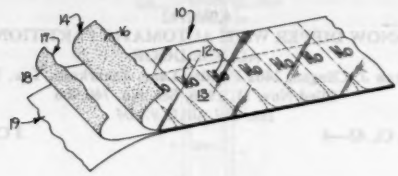
1. A substantially opaque printed heat sealable composite sheet material suitable for use as a packaging material and

characterized by versatility of graphic design and color selection, said sheet material comprising, in combination:

a front film of a transparent heat resistant polymer,

a layer of printing underlying said front film and visible on the outer surface of the film,

a rear film of pigmented polymer of a predetermined color having a readily heat sealable outer surface, and



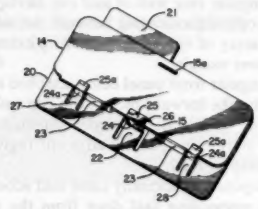
an intermediate film of a pigmented polymer tightly bonded to the inner surface of said front film and to the inner surface of said rear film and serving to increase the opacity of the sheet material and to enhance the brightness and purity of color of said layer of printing.

4,048,737

DUAL IDENTIFICATION CARD AND IDENTIFICATION CARD HOLDER

Clifton Eugene McDermott, 1778 Oakridge Drive, Salt Lake City, Utah 84106

Filed Feb. 12, 1975, Ser. No. 549,163
Int. Cl.² G09F *11/02*
U.S. Cl. 40—2.2 **7 Claims**



1. A duel identification card having a generally rectangular shape and containing:

similarly spaced indentations on either side of said card between the top and bottom thereof;

a score line running from one indentation to the other dividing the card into an upper section and a lower identification section;

a generally vertical notch in the top of said card offset from the horizontal center and extending to and encompassing a portion of said score line dividing the upper section into an upper identification section and a tab section.

4,048,738

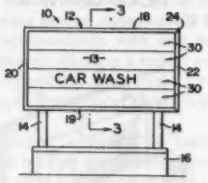
DISPLAY SIGN AND REPLACEABLE MESSAGE

Edward R. McHenry, 2935 Hammon Drive, Youngstown, Ohio 44511

Filed July 26, 1976, Ser. No. 708,542
Int. Cl.² G09F *3/18*
U.S. Cl. 40—16 **4 Claims**

1. A sign comprising a frame means enclosing an accessible center area and having a frame section movable to expose an edge of said center area,

a plurality of flattened tubular vertically aligned transparent indicia carriers filling said center area, said indicia carriers each including a vertically extending and protruding rib at one vertical margin thereof, which rib extends longitudinally of said indicia carrier, and a vertically extending recess extending longitudinally of the carrier at the other vertical margin thereof and open at such vertical margin thereof to engage and interlock with the rib of an adjacent one of said indicia carriers, said ribs and recesses of adjacent ones of said indicia carriers being slidably interlocked with each other, and



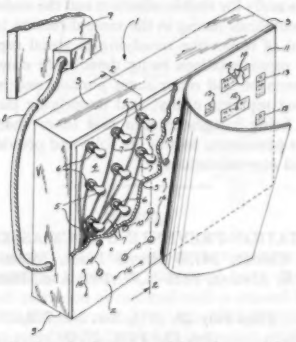
indicia plates slidably received in and positioned by the walls of at least one indicia carrier, said indicia plates being visible through a front wall of said indicia carriers.

4,048,739

VISUAL DISPLAY WITH BACKLIGHTING

Lawrence M. Benton, Jr., 1727 N. 34th St., Milwaukee, Wis. 53208

Filed Aug. 14, 1975, Ser. No. 604,848
Int. Cl.² G09F *13/10*
U.S. Cl. 40—106.1 **3 Claims**



1. A visual display device comprising, in combination:

a. a frame comprising a generally enclosed substantially sealed box,

b. a plurality of forwardly extending spaced light emitting members disposed within said box,

c. means to selectively actuate said members,

d. said box including a support wall disposed forwardly of said light emitting members,

e. a display surface disposed on the front of said support wall and co-extensive therewith and with said surface comprising a removable flexible light transmissive imperforate membrane having a plurality of discrete spaced display indicia portions thereon,

f. a plurality of light transmitting apertures disposed on said support wall directly forwardly of said light emitting members and behind and in registry with said display indicia so that when said light emitting members are selectively actuated said apertures will controllably transmit the light therefrom to form a spot on said display membrane to illuminate only the indicia portion with which the respective lit member corresponds,

g. and means for creating a membrane holding negative air pressure at said light transmission apertures to removably secure said membrane to the front face of said support wall.

4,048,740

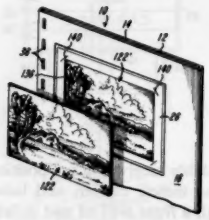
POST CARD FOLIO

Donald J. Zitzelberger, and Dorothy A. Zitzelberger, both of 7440 E. 42nd St., Tucson, Ariz. 85730

Continuation-in-part of Ser. No. 405,674, Oct. 11, 1973, abandoned. This application July 9, 1975, Ser. No. 594,443

Int. Cl.[2] G09F *1/10*

U.S. Cl. 40—158 R **23 Claims**



1. A folio, including overlying and underlying pictorial representations on respective outer and inner sheet portions, said inner sheet portion having the character of an insert provided with permanent pictorial representations on each of its opposite faces, said outer sheet portion being in two parts with each part beig applied to a respective face of said insert and each having at least one detachable pictorial representation thereon to superpose over respective permanent representations on said insert, the overlying pictorial representations facing outwardly for visible selection and the underlying pictorial representations facing in the same direction to be exposed by removal of respective overlying pictorial representations, said latter representations being detachably comprised in respective parts of said outer sheet portion and in a detached form having separate utility, said underlying pictorial representations being integrated into said inner sheet portion to remain as a permanent part of the folio and providing a record of detached representations.

4,048,741

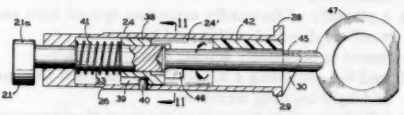
ROTATION-PREVENTING LOCK ASSEMBLY

Daniel J. Chiodo, 14730 Harris Place, Miami Lakes, and Charles S. Alvarez, 5735 N.W. 14th Ave., Hialeah, both of Fla.

Filed July 29, 1976, Ser. No. 709,657

Int. Cl.[2] F41C *27/00*

U.S. Cl. 42—1 LP **15 Claims**



1. A safety lock assembly for a gun having a rotatable cylinder, said lock assembly comprising:

a lock housing shaped and dimensioned for slidable insertion into a chamber of the cylinder;

an eccentric lock located at the front end of said lock housing and coupled to the latter for insertion in unison with the lock housing into said cylinder chamber to a position in front of the cylinder, said eccentric lock being rotatably adjustable between a retracted position in which it is disposed completely within the peripheral outline of said lock housing and a locking position in which it projects transversely beyond the peripheral outline of said lock housing

a. for engagement laterally against the body of the gun to prevent rotation of the cylinder, and

b. for engagement longitudinally against the front of the cylinder to prevent withdrawal of the lock housing therefrom;

and key-operated means in said lock housing accessible by a key inserted into the back end of the lock housing and operable by the key to turn the eccentric lock between said retracted and locking positions.

4,048,742

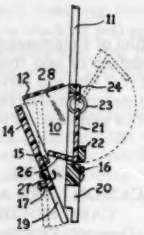
MINNOW DIPPER WITH AUTOMATIC PARTITIONING ACCESS DOOR

Andrew J. Clingan, 2402 Phillips Lane, Texarkana, Tex. 75501

Filed Nov. 11, 1976, Ser. No. 740,906

Int. Cl.[2] A01K *97/04*

U.S. Cl. 43—4 **3 Claims**



1. A minnow dipper comprising:

a normally enclosed cup in the form of a hollow inverted triangular prism;

the rectangular rear wall of said cup having an intermediate access opening extending between the sides of the cup and a first array of spaced downwardly extending teeth along the lower margin;

the rectangular front panel being attached to an substantially covering the forward face of the cup and having a second array of spaced downwardly directed teeth along the lower margin in spatially adjacent registration with said first array of teeth;

a door disposed to normally close said access opening, hinge means suspending said door from the superjacent body portion and buoyant means fixed to said door;

said door including a closure portion and a partitioning wall portion extending forwardly into the cup enclosure from the lower margin of said closure portion and dividing the cup enclosure to define an upper chamber and a smaller lower chamber;

said buoyant means being effective to open said door concurrently with the immersion of said cup in water when said cup is disposed in a predetermined angular relationship with a vertical plane; and

a manipulative handle extending outwardly from the upper margin of said rear wall.

4,048,743

HAND CASTER

Richard Lapinski, Fairfield West, Australia, assignor to Catuma Pty. Limited, Fairfield, Australia

Filed Feb. 23, 1976, Ser. No. 660,389

Claims priority, application Australia, Apr. 23, 1975, 80490/75

Int. Cl.[2] A01K *87/00*

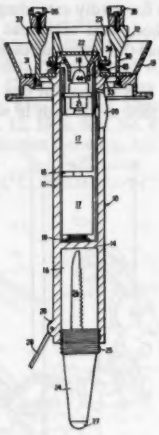
U.S. Cl. 43—17.5 **9 Claims**

1. A hand caster comprising a tubular handle, having two ends at least one battery disposed within said handle,

a light emitting means mounted on one end of said tubular handle being electrically operatively associated with said at least one battery,

abutment means comprising an annular flange on said one

end of said tubular handle coaxially surrounding said light emitting means,



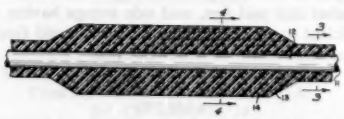
a casting head rotatably coaxially mounted on said annular flange, and engagement means adjustably frictionally holding said casting head on said annular flange.

4,048,744

FLY FISHING LINE

Leon Chandler, Homer, N.Y., assignor to Cortland Line Company, Cortland, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,499
Int. Cl.[2] A01K *91/00*
U.S. Cl. 43—17.5 **4 Claims**



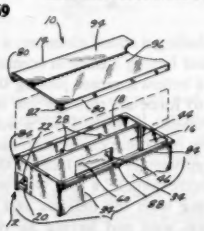
1. A fly fishing line having a section of said line near the end tip with a greater buoyancy than the remainder of said line, said section having a surface of a highly visible material, said section and said surface material being integral with said fly fishing line.

4,048,745

RODENT TRAP

Marvin A. Morford, 1815 Ashworth Road, West Des Moines, Iowa 50265

Filed Dec. 29, 1975, Ser. No. 644,579
Int. Cl.[2] A01M *23/04*
U.S. Cl. 43—69 **13 Claims**



1. A rodent trap comprising,

a housing having a passageway extending between opposite ends of said housing and a holding compartment in side-by-side adjacent relationship to said passageway, said compartment having an access opening for communication with said passageway,

said passageway including access openings at opposite ends and ramps extending inwardly and upwardly from said opposite ends and terminating at a trap door,

said trap door being pivotal downwardly placing said passageway in communication with said holding compartment access opening whereby a rodent stepping onto said trap door is dropped downwardly to a position for entry into said storage compartment through said access opening,

said housing including a slidable lid extending over said passageway and holding compartment, said lid having an opaque portion over said passageway whereby light cannot enter said passageway through said lid, and

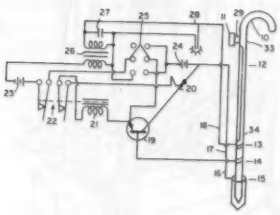
cooperating slide fastening means on said housing and lid of such a configuration that the lid can only be positioned on said housing in one way with said opaque portion over said passageway.

4,048,746

ELECTRONIC RODENT EXTERMINATOR

Joseph R. Dye, 25885 Stanford, Hemet, Calif. 92343

Filed Apr. 14, 1976, Ser. No. 676,979
Int. Cl.[2] A01M *19/00*
U.S. Cl. 43—98 **1 Claim**



1. An electronic rodent exterminator comprising:

a carrier member having an elongated body formed from wood and provided at one end with a curved handle;

a metellic touch control ring, a high voltage electrode, and a grounded metal sleeve mounted in spaced relation on the end portion of said carrier member opposite said handle end; electrical control means housed in said container and electrically connected to said control ring, electrode and sleeve; and electrical control means including first circuit means electrically connecting said grounded sleeve and said touch control ring through a pair of transistors,

a relay, a battery and a switch for locating a burrow and second circuit means electrically connecting said grounded sleeve and high voltage electrode through a transformer a condenser, a battery and a switch for electrocuting a rodent.

4,048,747

BASEBOARD TRAP FOR CRAWLING INSECTS

Francis V. Shanahan, Valley Stream, and Herman H. Feller, Brooklyn, both of N.Y., assignors to Stick-M-All, Inc., Valley Stream, N.Y.

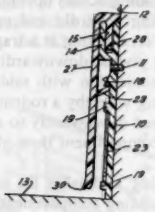
Filed Aug. 12, 1976, Ser. No. 713,779
Int. Cl.[2] A01M *1/14*
U.S. Cl. 43—114 **8 Claims**

1. A baseboard trap for crawling insects, comprising:

a. a flat elongated base,

b. means for securing said base along the bottom of a wall at the juncture between the wall and floor of a room,

c. a strip of tape bearing a pressure-sensitive adhesive on its exposed face on said base, said strip extending along substantially the entire length of said base, and



d. an elongated cover extending along but spaced from said base, said cover concealing said tape, and the lower edge of said cover being spaced fron the room floor to provide access for crawling insects to said base and tape.

4,048,748

COLLAPSIBLE DOLL HOUSE

Patti Glazer, 3101 Cummings Lane, Chevy Chase, Md. 20015

Filed July 19, 1976, Ser. No. 706,825
Int. Cl.² A63H *33/00*
U.S. Cl. 46—12 **6 Claims**

1. A collapsible multi-level doll house including a ground level and a roof level, each but the roof level comprising a substantially rigid stiffening member defining a horizontal plane, a floor in said plane, and collapsible walls of pliable sheet material having a lower end attached to the floor and an upper end attached to the floor of the next higher level, the collapsible walls and floors defining rooms, the roof level comprising a substantially rigid stiffening member definging a horizontal plane, a floor in said plane, and collapsible walls of pliable sheet material having a lower end attached to the floor of the roof level, the upper ends of the collapsible walls of the roof level meeting at an apex, and suspension means attached to the apex of the collapsible walls of the roof level, release of the suspension means causing the walls to collapse between the floors whereby the floors of the doll house are stacked in adjoining relationship, with the collapsed pliable sheet material walls flattened therebetween.

4,048,749

MARIONETTE BIRD

Carl Edward Zitting, and George Fredrick Zitting, both of P.O. Box 1767, Wenatchee, Wash. 98801

Filed June 16, 1976, Ser. No. 696,554
Int. Cl.² A63H *11/00*
U.S. Cl. 46—126 **5 Claims**

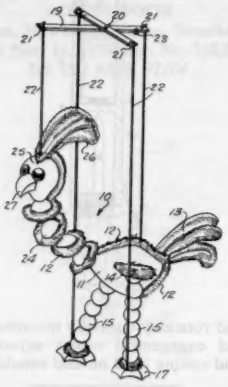
1. A manually operable bird puppet, comprising

a generally spheroid body,

an elongated flexible neck attached to said body and having a plurality of generally spheroid balls slidably carried on a flexible forwardly extending string,

a head having eyes and a beak slidably and rotatably carried on said flexible forwardly extending string with said balls between said body and said head and with said string being longer than the aggregate diameters of said balls and said head,

a pair of flexible legs secured at one end to said body and terminating at their distal ends in weighted feet,



a cross-shaped control device having a crossbar and a longitudinal bar attached at its forward end to the end of said flexible forwardly extending string remote from said body,

a rear string secured to said body and the rear end of said longitudinal bar and shorter than said forwardly extending string,

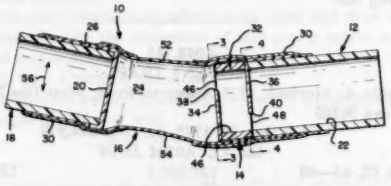
and a pair of side strings secured between the ends of said crossbar and said feet, said side strings having a length sufficient to cause appreciable slack in said flexible legs when said control device is elevated.

4,048,750

GAME CALL WITH TWO-DIAPHRAGM SOUNDER

Gilbert H. Wolfe, 412 W. 15th St., New Cumberland, Pa. 17070

Filed Mar. 26, 1976, Ser. No. 670,629
Int. Cl.² G10K *9/20*
U.S. Cl. 46—180 **25 Claims**



1. A game call including a sound chamber, a handle joining the sound chamber and having a horn in communication with the sound chamber, a bellows, means joining the bellows and the sound chamber to force air through the sound chamber upon collapse and extension of the bellows, a weight secured to the bellows away from the sound chamber to facilitate collapse of the bellows upon movement of the handle, the sound chamber including an interior volume, a first wall with an opening therein communicating with the bellows and a second wall spaced from said first wall and having an opening therein communicating with the horn, a first flexible diaphragm normally closing said first opening and a second flexible diaphragm normally closing said second opening, each diaphragm

including a taut edge flexible to permit movement of air into and out of the sound chamber upon movement of the bellows.

4,048,751

REMOTELY STEERED TOY BOAT

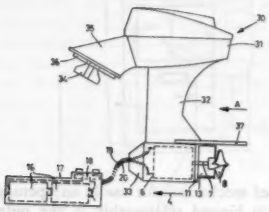
Karl-Heinz Muller-Seidel, Zirndorf, and Klaus Muller-Seidel, Weiherhof, both of Germany, assignors to Firma Michael Seidel, GmbH. & Co. KG, Zirndorf, Germany

Filed Apr. 12, 1976, Ser. No. 675,868

Claims priority, application Germany, Apr. 18, 1975, 2517262; June 6, 1975, 2525252

Int. Cl.[2] A63H *23/04*

U.S. Cl. 46—250 **18 Claims**



1. A drive for a remotely steerable toy boat comprising:

a reversible motor;

a propeller shaft;

a propeller disposed below the waterline, mounted on said shaft and adapted to be driven by said reversible motor; and

means on said boat for causing turbulent water to exert an unbalanced laterally-directed force on said boat when said motor rotates in the reverse direction, whereby said boat may be turned, said means including a stationary deflector shield disposed below said waterline and laterally of the propeller.

4,048,752

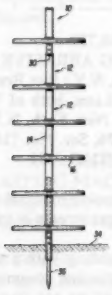
SUPPORTS

Howard Anderson, Accord, N.Y. 12404

Filed Nov. 24, 1975, Ser. No. 634,335

Int. Cl.[2] A01G *17/14*

U.S. Cl. 47—47 **4 Claims**



1. A multisectional plant support and base adapted to be employed in a generally vertical orientation, said multisectional support comprising: a plurality of support members, each said member comprising a tubular hub and a support component surrounding and fixed to said hub, the hub component of each said member including a first, upwardly extending tubular member and a second, downwardly extending member having its upper end extending into and fixed to the lower end of the upwardly extending member, said downwardly extending member also having an external diameter which is substantially equal to the internal diameter of the upwardly extending member, each of said upwardly extending tubular members being identical to each other and each of said downwardly extending members being identical to each other, a lowermost one of said support members being said base for said multisectional support, whereby said support members can be telescopically mounted and supported one above the other onto said lowermost support member with the lower end of the upwardly extending tubular hub member of each but said lowermost support member engageable with the upper end of the corresponding tubular member of the support member therebeneath to thereby vertically space apart the support components of the support members by distances determined by the lengths of said upwardly extending tubular hub members.

4,048,753

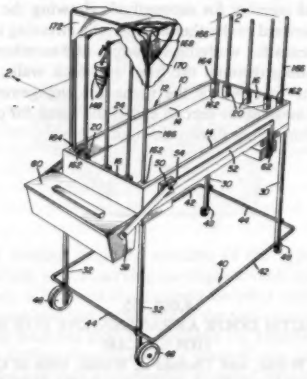
HYDROPONIC GARDEN STRUCTURE

David B. Roberts, Jr., 211 4th Place, SW., and Joseph L. Wells, 10366 Antilles Drive, both of Largo, Fla. 33540

Filed Feb. 19, 1976, Ser. No. 659,551

Int. Cl.[2] A01G *31/00*

U.S. Cl. 47—59 **8 Claims**



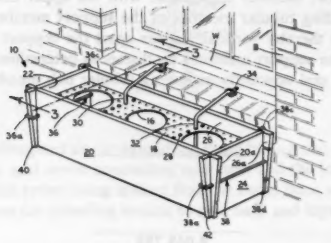
1. In combination, a horizontal tray, a liquid nutrient reservoir adapted to receive a predetermined amount of liquid nutrient therein, a support means supporting said reservoir in counterbalanced fashion for vertical shifting relative to said tray between an upper position elevated relative to said tray and a lowered position depressed relative to said tray, said support means, when said predetermined amount of liquid nutrient is disposed in said reservoir, being slightly overbalanced to cause said support means to shift said reservoir, by gravity, toward said depressed position, drain means communicating the lower portions of the interior of said tray and reservoir for draining of said nutrient from said reservoir into said tray upon movement of the reservoir to said upper position and return drainage of said nutrient from said tray into said reservoir upon subsequent movement of said reservoir to said depressed position, said support means including a counterbalance body counterbalancing said reservoir, said counterbalance body comprising a liquid tank including second drain means operative to drain said tank at a slower rate than said reservoir may drain into said tray, when said reservoir is in said elevated position, and weighting liquid supply means operative to supply weighting liquid to said tank at a rate slower than the rate at which liquid may drain therefrom through said second drain means.

4,048,754

WINDOW BOX PLANTER WITH TOOL-FREE QUICK SET-UP AND HANGING ADJUSTMENT

Leon E. Laux, 900 Fairway Drive, Towson, Md. 21204

Filed July 8, 1976, Ser. No. 703,538
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—68 **13 Claims**



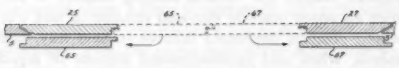
1. In a window box having front, back and end walls, plant holding means, and hanging and standoff means, the improvement comprising: at least one of the end walls and plant holding means being between the front and back walls for securance thereto, a member proximate each end of the window box extending horizontally thereacross, means for wedging one end of a said member for supportively drawing the front and back walls toward each other and thereby effecting said securance, the means for wedging including said member having a shank extending through the front and back walls, a wedge, means at the first end of the shank for engagement by the wedge, and mean at the second end of the shank for preventing the shank from being drawn through.

4,048,755

FULL LENGTH DOOR ARRANGEMENT FOR RAILWAY HOUSE CAR

Norbert S. Wolak, and Thomas J. Wolak, both of Cicero, Ill., assignors to Evans Products Company, Portland, Oreg.

Filed June 14, 1976, Ser. No. 695,382
Int. Cl.[2] E05D *15/10*
U.S. Cl. 49—130 **28 Claims**



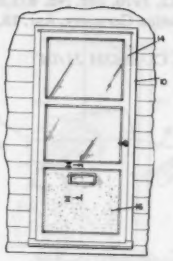
1. In a wall having a horizontally elongated rectangular opening, a pair of parallel horizontal tracks on the wall beneath said opening, a pair of end doors mounted in spaced apart relation on one of said tracks for sliding movement lengthwise of said wall, door stops on the wall adjacent the ends of said opening each wedgingly engageable with the adjacent end of one of said end doors to limit its movement lengthwise of the opening and to force the adjacent margin of the respective end door against the wall, center door structure mounted on said other track for movement transversely of the wall into and cut of a closed position in the space between said end doors and longitudinally of the car parallel to said end doors, said center door structure having vertical marginal portions overlyingly engageable with adjacent vertical marginal portions of said end doors when in the closed position for holding the adjacent marginal portions of said end doors against the wall.

4,048,756

AIR RELIEF MECHANISM

James R. Lawrence, Brazil, Ind., assignor to Raymond Lee Organization, Inc., a part interest

Filed July 16, 1976, Ser. No. 706,112
Int. Cl.[2] E06B *7/28*
U.S. Cl. 49—171 **3 Claims**



1. An air relief mechanism for use in an opening in a storm door disposed in hinged relationship in the outer side of a casing around a door opening containing an inner door disposed in hinged relationship within the casing, said mechanism comprising:

an open inner rectangular frame disposed on the inside surface of the storm door and sealed into the periphery of said opening;

a screen disposed in said inner frame and filling the opening therein;

an open outer rectangular frame disposed on outside surface of the storm door and sealed into said opening, said outer frame having a slot disposed outside the storm door; and

a flap pivotally disposed in said outer frame between the inner frame and said slot, said flap being biased into a normal first vertical position at which said opening and said slot are isolated from each other,, said flap responding to an air pressure differential developed when one of said doors is moved from open to closed position while the other door is in the closed position to momentarily assume a second inclined position at which said opening and said slot communicate with each other and said differential is quickly reduced to zero.

4,048,757

SYSTEM FOR METERING ABRASIVE MATERIALS

James Michael Kubus, Buffalo, N.Y.; Ray Bruce Seese, Conroe, and Bela Lee Watson, San Leon, both of Tex., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,670
Int. Cl.[2] B24C *3/32*
U.S. Cl. 51—436 **3 Claims**

1. A system for metering abrasive material into a flowing gas stream which abrasive laden gas stream is to be used to clean the interior of a pipeline,

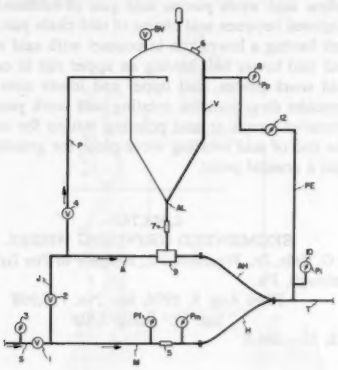
a gas supply line communicating with a source of gas and branching into the main gas line communicating with the pipeline to be cleaned and jet gas line; said jet gas line containing a flow control valve and branching downstream of said flow control valve into a pot gas line and an abrasive gas line; said pot gas line communicating with the top of an abrasive vessel and having a valve for controlling the pressure in the top of said abrasive vessel, a mixing chamber located in said abrasive gas line and communicating with the bottom of said abrasive vessel, a metering orifice between said mixing chamber and the bottom of said vessel to assist in the metering of abrasive flow from said vessel; a gas flow orifice located in the main gas line between the source of gas and the pipeline to be cleaned; a pressure indicating line connected from the top of said

vessel to a point adjacent the inlet in of said pipeline and containing a pot pressure gage adjacent the top of said vessel and a pipeline pressure gage adjacent the inlet to said pipeline and pressure differential gage therebetween for reading the difference in the dynamic pressure at the pot pressure gage and the inlet pressure gage.

3. Method for metering abrasive materials in a pipeline cleaning process wherein an abrasive laden gas stream is used to clean the interior of said pipeline. comprising

providing a main gas stream from a source of gas to a pipeline to be cleaned;

regulating the flow of siad main gas stream to provide the desired flow rate to be injected with said pipeline;



diverting some gas flow from the main gas stream to a mixing chamber and to the top of a vessel containing abrasive materials to be entrained in a gas stream;

metering said abrasive materials from the bottom of said vessel into said mixing chamber;

entraining said metered abrasive material in said gas flow through said mixing chamber;

controlling the pressure in the top of said vessel until the difference in the pressure in the vessel and the pressures at the pipeline to be cleaned is zero and then

combining the abrasive entrained gas flow with the main gas stream and injecting said combined streams into the pipeline to be cleaned.

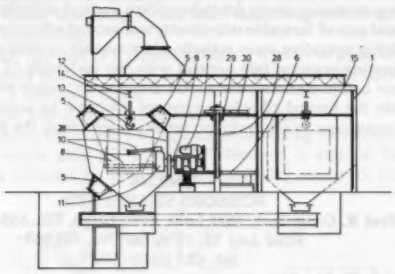
4,048,758

SAND-BLASTING MACHINE FOR CASTINGS

Martin Weis, Ettlingen, and Adolf Scholz, Karlsruhe, both of Germany, assignors to Badische Maschinenfabrik GmbH, Germany

Filed July 14, 1976, Ser. No. 705,244
Claims priority, application Germany, July 23, 1975, 2532837
Int. Cl.[2] B24C *3/00*
U.S. Cl. 51—416 **15 Claims**

1. A machine for blasting castings as workpieces, the machine comprising: a plurality of working stations including one or more blasting stations, said working stations being arranged in a cabin such that the workpieces pass through these stations in succession, wherein at least the part of the cabin for the blasting stations is constructed in arcuate form, a turntable disposed centrally with respect to the arcuate cabin part, workpiece carriers which are capable of rotating about horizontal axes being mounted on said turntable, and extending outwardly from the turntable through the inner boundary wall of the arcuate cabin through a horizontal slot, and an overhead conveyor positioned above the arcuate cabin part which extends



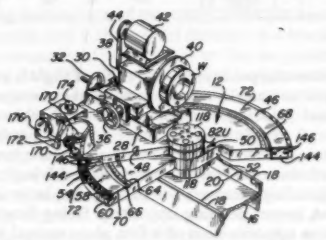
along a corresponding arcuate course and has workpiece reception hooks extending through a slot in the roof of the cabin.

4,048,759

TURNTABLE SUPPORT STRUCTURE FOR RADIUS MILLS AND THE LIKE

Robert H. Christon, 1293 S. Race St., Denver, Colo. 80210

Filed Nov. 10, 1976, Ser. No. 740,413
Int. Cl.[2] B24B *5/00, 41/02*
U.S. Cl. 51—97 R **16 Claims**



1. In a contour grinding machine of the type having an elongated bed, a tool-carrying carriage movable longitudinally of said bed, a horizontally-disposed bedplate resting in fixed position upon said bed in the path of the tool-carrying carriage, a turntable mounted atop the bedplate for relative movement along the surface thereof about a vertical axis, and a second carriage for carrying a workpiece mounted stop the turntable for movement therewith about said vertical axis as well as independent movement relative thereto and to the tool-carrying carriage, the improved turntable support subassembly which comprises: a pair of pads depending from the underside of the turntable in spaced relation to one another and to said vertical axis of turntable movement positioned and adapted to slide along the upturned surface of the bedplate; a pivot pin located at the vertical axis of turntable movement cooperating with the pads to define a three-point turntable support, said pivot pin including a stem portion journalled for rotation in the bedplate about said axis of turntable movement and a ball atop said stem portion having a spherical surface whose center lies on said axis; a bearing-receiving cavity in the underside of the turntable positioned and sized to loosely receive the pivot pin ball; an upper socket bearing segment having the underside thereof shaped to receive the top of the pivot pin ball for limited universal movement; first adjustment means mounting the upper socket bearing segment within said bearing-receiving cavity for vertical adjustment along said axis of turntable movement, said upper socket bearing segment and first adjustment means cooperating with one another upon actuation of the latter to raise and lower the portion of the turntable resting on the pivot pin relative to those portions supported on the pads; a lower socket bearing segment apertured and shaped to loosely receive the stem portion of the pivot pin and journal

the underside of the pivot pin ball for limited universal movement when placed thereagainst; and, second adjustment means mounted the lower socket bearing segment within said bearing-receiving cavity for independent vertical adjustment along said axis of turntable movement, said second adjustment means being operative upon actuation in a manner to raise the lower bearing segment into contact with the underside of the pivot pin ball to complete the socket therefor and retain said turntable for limited tiltable movement effective to accommodate unevenness in the bedplate surface over which the pads slide.

4,048,760

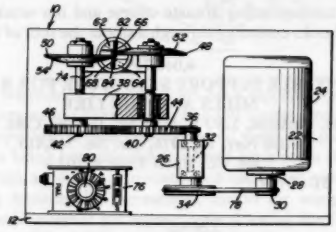
SCISSORS SHARPENER

Fred R. Gangelhoff, 1691 Lake Ave., Largo, Fla. 33540

Filed July 15, 1976, Ser. No. 705,562

Int. Cl.[2] B24B *3/52*

U.S. Cl. 51—116 **9 Claims**



1. Scissors sharpener including a pair of slightly peripherally overlapped and axially spaced grinding members, means journaling said grinding members for rotation about generally parallel axes of rotation, said rotary grinding members including remote axial faces having outer peripheral oppositely bevelled portions, rotary torque input means drivingly connected to said grinding members for driving the latter in opposite directions, means defining oppositely facing bearing surface portions on opposite sides of a first plane normal to said axes and disposed between the overlapped portions of said grinding members, said bearing surface portions being disposed substantially in a second plane containing said axes and lying substantially in a third plane normal to said first and second planes and generally bisecting the peripherally overlapped portions of said grinding members.

4,048,761

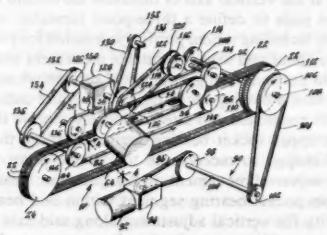
PAPER STICK POINTING APPARATUS

Edward D. Cottrell, Cattaraugus, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Filed July 9, 1976, Ser. No. 703,971

Int. Cl.[2] B24B *3/60, 21/02*

U.S. Cl. 51—138 **2 Claims**



1. An apparatus for forming a substantially conical point on a cylindrical workpiece comprising, a combination:

a. endless carrier means for transporting individual ones of said cylindrical work pieces to a pointing station with one end of said work piece projecting beyond a lateral edge of said carrier means, said endless carrier including a pair of chains each chain of said chain pair having a plurality of identical inner and outer links disposed in an overlapping portion relationship forming opposite parallel edges of each said chain, said overlapping chain portions being pivotally connected to each other, each said link being provided with a centrally disposed upright portion, adjacent link upright portions forming a pocket for receiving one of said work pieces therein;

b. hopper means cooperating with said carrier means for supplying individual work pieces to each said carrier means pockets;

c. a pair of endless belts, one of said belt pair being disposed below said work pieces, said pair of endless belts being disposed between said chains of said chain pair, said upper belt having a lower run in contact with said work pieces and said lower belt having an upper run in contact with said work pieces, said upper and lower runs moving in opposite directions for rotating said work pieces; and

d. abrasive means at said pointing station for contact with the end of said rotating work piece for grinding said end into a conical point.

4,048,762

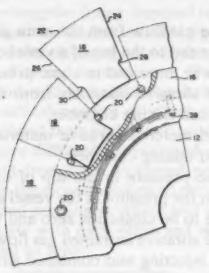
SEGMENTED GRINDING WHEEL

James G. Bair, Jr., Wexford, Pa., assignor to Fox Grinders, Inc., Pittsburgh, Pa.

Filed Aug. 9, 1976, Ser. No. 712,968

Int. Cl.[2] B24D *5/06*

U.S. Cl. 51—206.5 **1 Claim**



1. A grinding wheel comprising:

a. a cylindrical wheel adapted to be rotated about its axis, the wheel having a peripheral channel of truncated pyramidal cross section formed at the periphery by opposing sides of the wheel and a base;

b. a plurality of bolts passing through the sides of the wheel and traversing the channel intermediate its top and bottom whereby the sides of the channel are held against axial separation, the bolts are spaced apart equally about the wheel;

c. a plurality of uniform grinding segments of generally truncated pyramidal cross section inserted into the channel, each segment having an outer edge which engages a work piece when grinding and a bottom area opposite the outer edge which is inserted within the channel between the sides of the channel, each segment has a pair of opposite side faces, each segment has a pair of opposed side edges with each having a radius in the bottom area, each radius is adjacent to one bolt and a pair of adjacent segments are adjacent to the same bolt;

d. a radially movable wedge at each segment inserted between at least one face of one segment and one side of the channel; and

e. means for radially moving said wedge from a locking position engaging the segment between the other side of

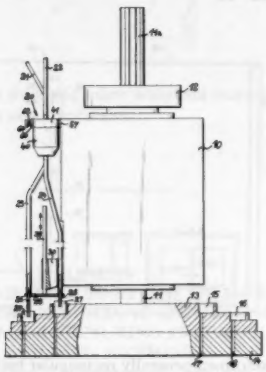
the channel and the wedge and a release in which the segment is released.

4,048,763

METHOD FOR SURFACE-, PLANE-PARALLEL-, AND PLAIN LAPPING

Jos M. Janssen, Mettmann, Germany, assignor to JMJ Werkzeugmaschinen GmbH fuer Feinbearbeitung, Mettmann, Germany

Division of Ser. No. 605,156, Aug. 15, 1975, Pat. No. 3,978,621. This application Feb. 19, 1976, Ser. No. 659,578
Claims priority, application Germany, Aug. 27, 1974, 2440978
Int. Cl.² B24B *1/00*
U.S. Cl. 51—281 SF **5 Claims**



1. A method for surface lapping, plane-parallel lapping and plain lapping of workpieces with a lapping abrasive, comprising the steps of

feeding a definite quantity of a lapping abrasive on a work piece in at least two radially spaced apart and operatively separated circular paths on the work piece which paths, respectively, are concentric to one another and have different diameters,

feeding the lapping abrasive separately in different dosed quantities in each of said at least two paths, respectively, and

machining said work piece with said lapping abrasive in said at least two radially spaced apart and operatively separated paths and in said differently dosed quantities, respectively, into a surface finished, plane-parallel finished and plain finished work piece, respectively.

4,048,764

METHOD FOR MICRO-FINISH MACHINING OF COMPOUND, CIRCULAR ARC-SHAPED PROFILED SURFACES IN ANNULAR WORKPIECES

H. Günter Schmitz, Wermelskirchen, Germany, assignor to Supfina Maschinenfabrik Hentzen KG, Remscheid, Germany

Division of Ser. No. 493,467, July 31, 1974, Pat. No. 3,959,928. This application Mar. 12, 1976, Ser. No. 666,408
Claims priority, application Germany, Aug. 6, 1973, 2339726
Int. Cl.² B24B *1/00*
U.S. Cl. 51—291 **5 Claims**

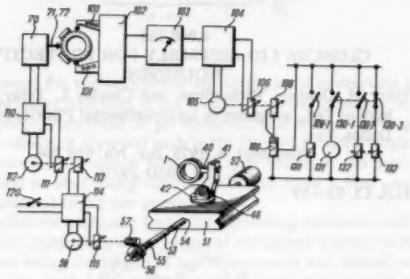
1. In a method for micro-finish machining of circular arc-shaped profiled surface in annular workpieces in two phases utilizing an apparatus including: means, mounting the workpiece to the apparatus; a honing tool; means mounting the honing tool for pivotal movement about an axis, which is perpendicular to the longitudinal axis of the mounted workpiece; means for displacing the honing tool mounting means and consequently the honing tool in a direction parallel to the longitudinal axis of the mounted workpiece; means for pressing the honing tool against the profiled surface to be machined, the improvement in the method comprising the steps of:

a. engaging the workpiece prior to mounting the same to the workpiece mounting means with measuring instruments and measuring;

aa. the location of a plane containing a point of predetermined position within the profiled surface with respect to a reference plane;

bb. the diameter of the annular workpiece;

b. actuating the means for displacing the honing tool mounting means after the workpiece measured in step (a) has been mounted to the workpiece mounting means for displacing the honing tool mounting means and consequently the honing tool in the parallel direction as a function of the measurement made in step (aa) so that the position of the pivotal axis defined by the honing tool mounting means corresponds to the distance of the plane containing the point of predetermined position from the reference plane;



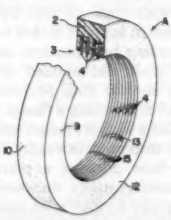
c. applying the honing tool to the workpiece by actuating the tool pressing means over a time period, which is determined as a function of the measurement made in step (bb) so that the reduction of the diameter of the workpiece by honing depends on the diameter measured before the honing operation in order to compensate for variations of diameter to reduce their tolerances.

4,048,765

NON-CELLULAR POLYURETHANE WHEEL IN A PROCESS FOR FINISHING A METAL WORKPIECE

Ivar J. Samuelson, Fairview Park, Ohio, assignor to The Manufacturers Brush Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 465,843, May 1, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,539
Int. Cl.² B24B *1/00, 37/02*
U.S. Cl. 51—328 **6 Claims**



1. A process for finishing a metal workpiece without significant stock removal comprising rotating the workpiece about its axis while contacting the external surface thereof with the external peripheral surface of a circular finishing wheel having a peripheral speed from about 5000 to about 9000 surface feet per minute, characterized in that said finishing wheel comprises a dense molded non-cellular annular matrix having a

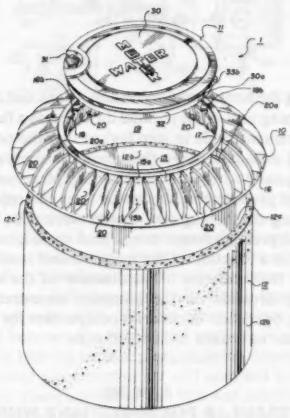
circumferential reinforcing means, the radially outer portion of said matrix being deformable and being formed of a cured solid elastomeric polyurethane composition having a no-grain Shore A durometer hardness from about 30 to about 55 and a tensile strength of at least 4000 pounds per square inch and being capable of being elongated several hundred percent, said composition comprising a solid linear polyurethane which is the reaction product of a long-chain polyol having terminal hydroxyl groups and a molecular weight of at least 500 and an organic polyisocyanate having 2 to 3 functional isocyanato groups, said composition containing, per 100 parts by weight of said polyurethane, at least 50 parts by weight of finely divided abrasive refractory grains.

4,048,766

CLOSURE LID ASSEMBLY FOR PROTECTIVE HOUSINGS

Peter H. Dantzer, Richardson, and Charles L. Tatay, Dallas, both of Tex., assignors to Intercontinental Plastics Mfg. Co., Dallas, Tex.

Filed Sept. 4, 1975, Ser. No. 610,266
Int. Cl.[2] E02D *29/10*
U.S. Cl. 52—19 **1 Claim**



1. A two part closure assembly for closing off the surface access opening to a plurality of cylindrically shaped housings having peripheral walls of respectively different radii, the housings being of the type disposed around, and employed to protect, underground installations, said two part closure assembly comprising:

a. a closure support means of synthetic polymeric material construction and adapted for removable, but non-translatable, coupling with each of said cylindrically shaped housings, said closure support means comprising a circular, laterally extending base portion; an annular side wall integrally joined with, and inclined with respect to, said base portion; an annular ring portion integrally joined with said side wall and having a flange vertically recessed therefrom to define a support ledge, said annular side wall and ring portion displaced inwardly from the outer periphery of said base portion; a plurality of arcuately shaped ribs circumferentially disposed around the base portion and integrally formed with said base portion, side wall and ring portion; said ribs continuously extending from a location outside of, to a location inside, said annular side wall; a plurality of sets of circumferentially disposed lugs extending from the bottom surface of said base portion, each of said sets located at respectivey different radii along said base portion and corresponding to the radii of the peripheral walls of said cylindrically shaped housings, each of said lugs having surfaces adapted for non-translatable engagement with the peripheral wall of said housings; and a plurality of curcumferentially spaced notches in said flange; and

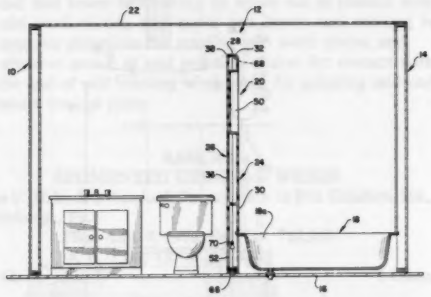
b. closure means of synthetic polymeric material removably coupled with said closure support means and closing off said surface access opening, said closure means supported by said support ledge and comprising projection means retainably received within one of said spaced notches.

4,048,767

BATHROOM PARTITIONS

Joseph Ferich, 10917 St. Mark, Cleveland, Ohio 44111

Filed Apr. 21, 1976, Ser. No. 679,013
Int. Cl.[2] A47K *3/16*
U.S. Cl. 52—35 **8 Claims**



1. A preformed generally rectangular bathroom partition of plastic sheet material mountable on prepositioned L-shaped support member means comprising, spaced apart parallel front and rear panels having top edges, bottom edges, outer side edges and inner side edges, wall means interconnecting and closing said panels along said top and outer side edges, said panels having opposed inner surfaces, said inner surfaces being spaced apart along said bottom and inner side edges to receive said support member means therebetween, mounting means on the inner surfaces of said panels for attaching said partition to said support members, said mounting means including a first mounting strip connecting said inner surfaces of said panels and extending from said wall means along said outer side edges toward said inner side edges and a second mounting strip connecting said inner surfaces of said panels and extending from said wall means along said top edges toward said bottom edges, said second mounting strip having key slot openings therethrough, said rear panel having an access opening therethrough, and reinforcing means between the inner surfaces of said panels inwardly of said wall means and said first and second mounting strips.

4,048,768

DEVICE FOR LOCKABLY SECURING APPURTENANCES TO A DECORATIVE WALL

Wayne W. Good, Sturgis, Mich., assignor to Harter Corporation, Sturgis, Mich.

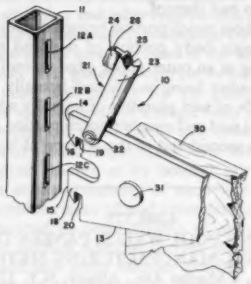
Filed Sept. 30, 1976, Ser. No. 728,432
Int. Cl.[2] E04B *1/00*; A47B *5/60*
U.S. Cl. 52—36 **5 Claims**

1. A device for lockably securing an appurtenance to a decoratable wall, the wall having at least one decoratable panel, and at least one spline with a plurality of slots therein, and a frame supporting the panel and splines, comprising:

bracket means to which the appurtenance may be attached having at least one hook member for removable insertion into a first slot in a spline, and

locking means mounted on said bracket means and movable

with respect thereto into engagement with a second slot of the same spline, for preventing disengagement of said



hook member from said spline while said locking means is engaged with said second slot.

4,048,769

BUILDINGS FORMED BY ONE OR MORE PREFABRICATED BUILDING SECTIONS, AND METHOD OF MANUFACTURING PREFABRICATED BUILDING SECTIONS

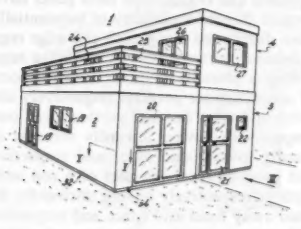
Cornelis van der Lely, 7, Bruschenrain, Zug, and Hendricus Jacobus Cornelis Nieuwenhoven, Hirssattelweg, 6340 Baar, both of Switzerland

Continuation of Ser. No. 439,591, Feb. 4, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 643,002

Claims priority, application Netherlands, Feb. 9, 1973, 7301828

Int. Cl.² E04H *1/12*

U.S. Cl. 52—79.7 **36 Claims**



1. A building comprising a plurality of prefabricated box-shaped sections, each said section having a framework of horizontally and vertically disposed metal beams whereby the walls of said sections each have a framework of horizontally and vertically disposed metal beams at the periphery thereof, at least one of said walls composed of cast material and having a substantially rectangular opening, at least three sides of said opening defined by said cast material, stiffening bars which are entirely encased in said cast material of said one wall, each of said stiffening bars being inclined relative to but not touching and spaced from both said vertically and horizontally disposed beams of said one wall, each corner of said opening having proximate thereto a portion of one of said inclined stiffening bars, said stiffening bar portion proximate each corner of the circumference of said opening being spaced therefrom within said cast material so as not to touch its respective said corner.

4,048,770

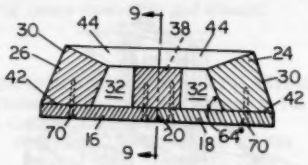
BUILDING STRUCTURE

Alexander J. McKenzie, III, Box 704, Wolfeboro, N.H. 03894

Filed Feb. 11, 1976, Ser. No. 657,165

Int. Cl.² E04B *1/32*

U.S. Cl. 52—81 **7 Claims**



1. A panel for use with other identical panels in erecting a space enclosing structure in the form of a partial icosahedron,

said panel comprised of six elements, said elements being two sheets of plywood each in the form of a right triangle whose hypotenuse is equal to twice the base and positioned to abut along their altitudes to form a two part equilateral triangular panel,

an equilateral triangular frame for supporting said panel, said frame comprising three identical elongated braces, each brace being the length of said hypotenuse and shaped as follows: each brace is four sided in cross section with a first side adapted to rest on an edge area of said panel, second and third parallel sides extending inwardly of said panel and away from the edges of said first side at an angle of approximately 69° and a fourth side at right angles to said parallel sides and at an angle to said first side of approximately 21°,

each brace cut at both ends at 30° to the long axis and at right angles to said first side to form two faces each trapezoidal in shape,

the six faces of said three braces being placed in face to face abutting pairs, and connected together to form a rigid equilateral triangular frame with said first sides lying in a common plane,

said frame mounted on said panel with said first sides in engagement with the edge areas of said panel and the said three pairs of abutting faces bisecting the three apexes of said panel,

said frame being securely affixed to said panel, and

a single nailing strip rectangular in cross section and overlapping and abutting altitude edges of said sheets, said nailing strip cut at one end to form two diverging equal sized parallelograms whose bottom and top edges are at 60° to each other and at 30° to the longitudinal axis of said strip, and the faces of said parallelograms are at 69° to the bottom of said strip,

said faces abutting the inner sides of said braces immediately adjacent the inner edges of that pair of abutting trapezoidal faces that are aligned with said abutting altitude edges of said sheets,

said nailing strip extending along said abutting edges to a position at which its other end, which is cut crosswise at 69° to its bottom, is in engagement with the inner side of the opposite brace at its mid-point, and the abutting edges of said sheets being securely affixed to said nailing strip.

4,048,771

DOOR FRAMING FIXTURE AND METHOD

Mark K. Thistlethwaite, Toledo, Ohio, assignor to The Vicon Supply Company, Toledo, Ohio

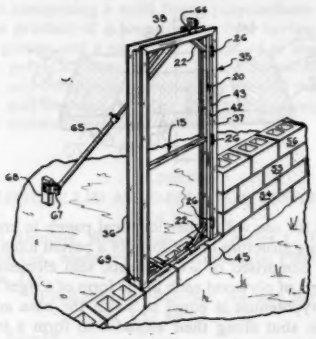
Filed May 14, 1976, Ser. No. 686,308

Int. Cl.² E04G *23/00*

U.S. Cl. 52—127 **14 Claims**

1. A door framing-fixture for use with a metallic frame having two opposed jambs and a connecting header, said door framing-fixture comprising a top member, a bottom member,

and a pair of opposed side members, said members being connected together to form an integral rectangular fixture complementary with the interior of such metallic frame, said integral rectangular fixture having an exterior periphery, wherein such periphery defines the desired interior alignment of the metallic



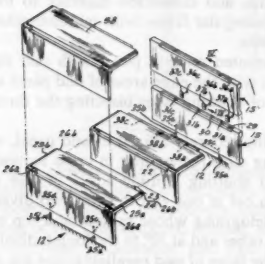
frame, brace members adjacent said bottom member extending rearwardly for connection to such metallic frame, said brace members being fixed to said bottom member, and a cross member extending between said opposed side members and being integrally attached to said side members.

4,048,772

MODULAR CRYPT SYSTEM

Michael F. Gaul, 2800 N. Lakeshore Drive, Chicago, Ill. 60657

Filed Apr. 5, 1976, Ser. No. 673,731
Int. Cl.[2] E04H *13/00*
U.S. Cl. 52—136 **7 Claims**



1. A modular crypt system adapted to provide the main structure support for a building, comprising:

a plurality of laterally adjacent inverted L-shaped modules, each module having a substantially planar load-bearing horizontal leg joined to a substantially planar load-bearing vertical leg at a respective first end of such legs so as to define a corner,

said module having a web-like reinforcement portion joined with said legs between inside adjacent surfaces of said legs,

said module having a notch portion position at an upper outer edge of said first end of the vertical leg, said notch portion being substantially aligned above said vertical leg and terminating at said first end of the horizontal leg;

a second end of the horizontal leg of one of said plurality of modules having a tongue portion extending therefrom, said tongue portion having an upper support surface located below an upper planar surface of said horizontal leg, said tongue portion being received and supported by a notch portion of a laterally adjacent module; and

at least one substantially vertical column-shaped load-bearing end member having a notch portion at an upper inner edge of a top end thereof,

said end member notch portion being substantially aligned above a main body portion of said end member and terminating at an outer upper edge thereof,

said end member being positioned laterally adjacent an end module of said plurality of laterally adjacent modules so that said end member notch portion receives and supports a second end of the horizontal leg of said end module.

4,048,773

ABOVE-GROUND POOL WALLS, PANELS THEREFOR, AND PANEL-MANUFACTURING METHODS

Merrill L. Laven, 4 Marion Ave., Albany, N.Y. 12203

Continuation-in-part of Ser. No. 428,882, Dec. 27, 1973, Pat. No. 3,938,199. This application Feb. 9, 1976, Ser. No. 656,594
Int. Cl.[2] E04H *3/16*
U.S. Cl. 52—169.7 **13 Claims**

1. In an above-ground pool, a plurality of upright adjoining wall panels situated in end-to-end relation along a predetermined enless path so that said panels surround a given space in which water for the pool can be situated, an upright rod situated between each pair of adjoining panels, each panel having a pair of opposed end regions and each panel having at each end edge region thereof a plurality of substantially rigid fastener portions distributed along each end edge region of each panel, said fastener portions at each end edge region of each panel including a plurality of inner fastener portions and a plurality of outer fastener portions respectively alternating in elevation with said inner fastener portions, said outer fastener portions respectively having inwardly directed surfaces directed inwardly toward said space and respectively formed with aligned grooves receiving part of a rod and said inner fastener portions respectively having outwardly directed surfaces directed away from said space and respectively formed with aligned grooves also receiving part of said rod, so that said rod can be situated in and removed from said grooves of said fastener portions at each end edge region of each panel only by being moved substantially vertically with respect to an upright panel, and the inner and outer fastener portions at an end region of one panel being situated respectively at the same elevations as outer and inner fastener portions at an adjoining end edge region of the next panel with all of the inner fastener portions at adjoining end edge regions of a pair of adjoining panels being interdigitated and all of the outer fastener portions at adjoining end edge regions of a pair of adjoining panels being interdigitated, so that by way of said rods said plurality of panels are held together to form a pool wall, said panels respectively having inner surfaces directed inwardly toward said space, and all of said inner fastener portions at each end edge region of each panel having inwardly directed surfaces respectively forming continuations of said inner surface of each panel, and the inner fastener portions at an end edge

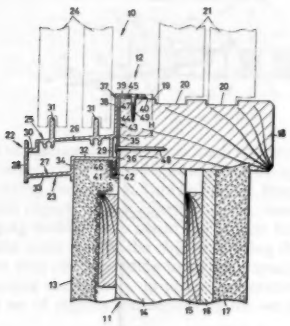
region of one panel being situated respectively between and respectively substantially filling the gaps between the inner fastener portions at an adjoining end edge region of the next panel with the inwardly directed surfaces of the inner fastener portions of adjoining end edge regions of a pair of successive panels forming a substantially continuous surface which forms a continuation of the inner surfaces of the adjoining panels so that all of said wall panels cooperate to form a substantially continuous inner wall surface for the pool, each wall panel being formed in its entirety of a single body of plastic material so that the entire pool wall consists only of said single bodies of plastic material which respectively form said panels and said rods, each panel having at its fastener portions a thickness greater than at the remainder of each wall panel, said outwardly directed surfaces of said inner portions being situated outwardly beyond an outer surface of each panel extending between said fastener portions thereof at each end region of each panel and said outer fastener portions also having outwardly directed surfaces situated outwardly beyond said outer surface of each panel extending between said fastener portions thereof at each end region of said panel, and said greater thickness of said fastener portions being provided only by the location of said outwardly directed surfaces of all of said fastener portions outwardly beyond said outer surface of each panel so that said inwardly directed surfaces of all of said inner fastener portions do not extend inwardly beyond the remainder of the inner surface of each panel and thus do not alter the continuity of said substantially continuous inner wall surface.

4,048,774

EXTERIOR WINDOW UNIT HAVING ADAPTER SILL MEMBER

Yukio Yamamoto, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1976, Ser. No. 684,888
Claims priority, application Japan, May 17, 1975, 50-66255
Int. Cl.² E06B *3/26*
U.S. Cl. 52—202 **5 Claims**



1. An exterior window unit for covering an opening in a building wall, the opening having a first sill, said exterior window unit comprising:

a. a frame having a second sill;

b. a pair of sashes mounted within said frame in parallel closely spaced planes;

c. an adapter sill member for extending along the length of the first sill, said member having a vertical section adapted to be secured flatwise against an exterior vertical surface of the first sill, and a horizontal section extending inwardly from said vertical section at the upper edge thereof and adapted to be secured flatwise against a horizontal top surface of the first sill, said adapter sill member having a marginal portion extending along its lower edge as a channel of upwardly opening U-shaped cross-section facing away from the first sill;

d. a first mounting means on said second sill having a vertical portion and a horizontal portion for being secured respectively to said vertical and said horizontal sections of said adapter sill member, said horizontal portion overlying said horizontal section for being secured directly to said first sill; and

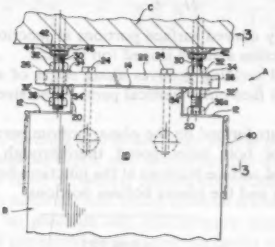
e. a second mounting means on said second sill having an engaging means received in said channel.

4,048,775

ANCHOR ASSEMBLY FOR PILASTERS

Harold J. Dielman, Cleveland, Ohio, assignor to The Sanymetal Products Co., Inc., Cleveland, Ohio

Filed Oct. 22, 1975, Ser. No. 624,588
Int. Cl.² E04H *1/00*; E02D *27/00*
U.S. Cl. 52—239 **3 Claims**



1. A pilaster anchor for mounting a pilaster on stud bolts which extend from an existing structure and which have a remote end portion disposed away from said existing structure comprising a pilaster end surface having stepped portions and an intermediate non-stepped portion;

a footer bar on said non-stepped portion of said pilaster extending over said stepped portions of said pilaster and having stud bolt holes located therein;

mounting means for securing said footer bar to said non-stepped portion;

said stud bolts passing through said stud bolts holes on said footer bar and having:

a first pair of adjustment nuts on said stud bolts to bear against a first side of said footer bar and be opposite a second side of said footer bar, said second side being spaced from said stepper portions of said pilaster; a second pair of adjustment nuts on said stud bolts to bear against said second side of said footer bar, and a pair of stabilizer nuts on said remote end of said stud bolts, said stud bolts extending to regions adjacent said pilaster end surface on said stepped portions, whereby, when said stabilizer nuts are in pressure contact with said pilaster end surface, a thrust is applied against said pilaster end surface by said stabilizer nuts and against said second side of said footer bar by said second pair of adjustmant nuts while said first pair of adjustment nuts acts against said first side of said footer bar.

4,048,776

STEEL COLUMN BASE MEMBER

Kuniaki Sato, Hiratsuka, Japan, assignor to Kajima Corporation, Tokyo, Japan

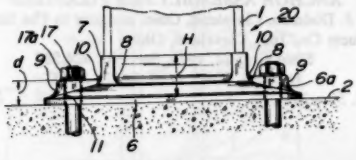
Filed Aug. 2, 1973, Ser. No. 385,166
Claims priority, application Japan, Aug. 21, 1972, 47.82799; Aug. 21, 1972, 47.82800
Int. Cl.² E04H *12/22*; E04C *3/02*
U.S. Cl. 52—297 **6 Claims**

1. A steel column base member for connecting a steel column member to a concrete foundation said member having a unitary body and comprising:

a substantially planar bottom plate portion engageable with said concrete foundation;

a projection extending from said bottom plate portion said projection having a top surface whose shape is substantially identical to the cross-sectional shape of the steel column member; said portion designed to support said column member

a sloped top surface connecting a bottom of said projection to said bottom plate portion to increase the thickness thereof as the planar bottom plate portion extends toward the bottom of said projection;



smoothly curved surface portions at junctions between the projection and the sloped top surface;

J-shaped welding grooves along edges of said top surface which face outer vertical parts of the steel column members;

abutments formed on the planar bottom portion and having anchor bolt holes bored therethrough and smoothly curved surface portions at the junctions between the abutments and the planar bottom portions.

4,048,777

BUILDING DECK STRUCTURE

Frank E. Carroll, Barrington, Ill., assignor to Carroll Research, Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 457,996, April 4, 1974, Pat. No. 3,965,641. This application Jan. 12, 1976, Ser. No. 648,500

Int. Cl.[2] E04C *1/00, 3/04;* E04B *5/10*

U.S. Cl. 52—309.12 **11 Claims**

1. A building deck structure comprising:

a spaced series of parallel sheet metal structural shapes which are symmetrical about a bisecting plane through a central web having a central web, two diagonal legs projecting downwardly from one end of said web forming an included angle of about 30° to about 90° between said legs and having its vertex at the bottom of the web, said diagonal legs having a vertical height of about 1½ to about 10 inches, each diagonal leg having a leg projecting downward at its extremity in a plane substantially parallel to said web, said legs being substantially parallel, each of said parallel legs having flanges extending outwardly at their extremity, a closure side extending between the extremities of said flanges enclosing the area formed by said diagonal sides, said parallel sides and said closure side, and a stiffening member at the other end of said web; and

decking assembly having its lower surface resting on said flanges and extending between adjacent structural shapes.

4,048,778

SHEETING-PLATE FOR TRENCH SHEETING

Josef Krings, Hans-Bockler-Strasse 23, D 5138 Heinsberg - Oberbruch, Germany

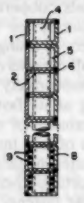
Filed Oct. 28, 1975, Ser. No. 626,057

Claims priority, application Germany, Jan. 2, 1975, 7500036[U]

Int. Cl.[2] E04C *2/34;* E21D *5/00*

U.S. Cl. 52—615 **7 Claims**

1. A new article of manufacture in the form of a sheeting-plate for trench sheeting of the type comprising first and second upstanding cover plates, spacers extending between said cover plates and maintaining said cover plates in spaced generally parallel relation, and reinforcing members extending vertically between said cover plates and transversely through said spacers, said sheeting-plate being improved by at least one of said cover plates being folded out of the plane thereof to form a plurality of laterally extending webs, said webs forming said spacers with said webs being horizontally disposed, and securing means securing said webs to an inner surface of the other of said cover plates, said webs being of a width equal to the spacing between said cover plates, said webs including portions of said one cover plate reversely folded upon themselves



and including a reverse fold opposing said other cover plate, said securing means being in the form of seam welding joining said folded edge to said other cover plate, and said webs have aligned recesses receiving said reinforcing members, said webs being formed on both of said cover plates and being generally arranged in alternating parallel relation.

4,048,779

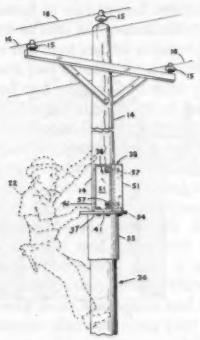
TURNBUCKLE CONNECTOR USEABLE IN A METHOD FOR REPLACING AN EXISTING UTILITY POLE WITHOUT DISTURBING HARDWARE MOUNTED THEREON

Frank P. Valenziano, Summit, and Daniel E. Olivier, Bedminster, both of N.J., assignors to Interpace Corporation, Parsippany, N.J.

Continuation-in-part of Ser. No. 606,073, Aug. 20, 1975, which is a continuation-in-part of Ser. No. 511,173, Oct. 2, 1974, Pat. No. 3,911,548. This application May 3, 1976, Ser. No. 682,758

Int. Cl.[2] E04C *3/30;* E02D *35/00*

U.S. Cl. 52—726 **8 Claims**



1. A turnbuckle connector useable in a method for replacing an existing utility pole, said existing pole comprising a proximal section having a bottom end attached to the earth and a distal section having hardware mounted thereon, without disturbing the hardware, said method comprising the steps of severing the distal section from the proximal section, thereby providing the distal section with a lower end,

temporarily supporting the severed distal section,

removing the proximal section,

providing a new pole section having an upper end,

attaching the new pole section to the earth in position to replace this existing proximal section in end-abutting relation to said distal section, and

connecting the distal section to the new proximal section in end-abutting relation;

said turnbuckle connector comprising:

an end-embracing unit adapted to surround and grip a portion of a first pole section to be joined in end-abutting relation to a second pole section, adjacent the end of said first pole section to be so joined, said end-embracing unit being provided with a first radially-projecting flange adjacent said end to be joined,

a second radially-projecting flange secured in fixed relationship to said second pole section adjacent the end thereof to be joined to said first pole section, and

means for rigidly securing said first radially-projecting flange to said second radially-projecting flange;

said end-embracing unit comprising a plurality of girdle plates, each of said girdle plates having a radially-projecting flange portion, said flange portions cooperating to form said first radially-projecting flange,

said end-embracing unit further comprising at least one turnbuckle adapted to secure said girdle plates in clamping circumferential disposition with respect to said first pole section.

4,048,780

METHOD AND APPARATUS FOR PLACING OBJECTS INTO BOXES

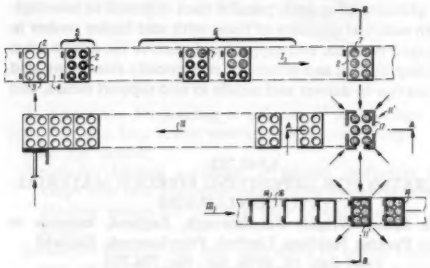
Alexis Chenevard, Morges, Switzerland, assignor to SAPAL Societe Anonyme des Plieuses Automatiques, Switzerland

Filed Aug. 30, 1976, Ser. No. 718,563

Claims priority, application Switzerland, Oct. 27, 1975, 13901/75

Int. Cl.[2] B65B *5/08, 35/38*

U.S. Cl. 53—26 **11 Claims**



1. A method of placing sets of objects, such as assortments of chocolates, in boxes, comprising disposing a set of objects in a template, conveying the objects disposed in the template to a table, holding the objects on the table by suction, removing the template, bringing mobile walls about the objects held on the table, moving the walls against the objects to bring the objects together into an area corresponding to an inner space of a box which is to receive the objects, gripping and conveying the thus assembled set of objects and depositing the set of objects in the box.

4,048,781

PROCESS FOR THE PRODUCTION OF A PRODUCT FILLED CONTAINER

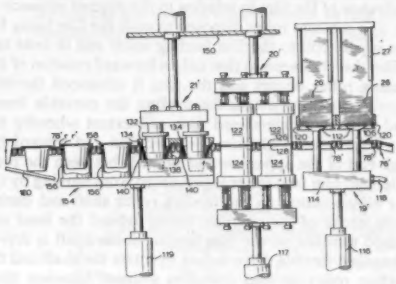
Poul Egon Johansen, West Hill, Canada, assignor to Portion Packaging Limited, Rexdale, Canada

Division of Ser. No. 543,977, Jan. 24, 1975, Pat. No. 3,964,237, which is a continuation-in-part of Ser. No. 357,785, May 7, 1973, abandoned. This application Jan. 22, 1976, Ser. No. 651,257

Int. Cl.[2] B65B *3/02*

U.S. Cl. 53—30 R **9 Claims**

1. A process of forming an individual rimmed plastic container preparatory to the filling and closing thereof from a relatively stiff resilient blank formed entirely of heat formable material which is essentially rigid at normal ambient temperatures, comprising the steps of fixing the peripheral portion of the blank while leaving the major central portion thereof unsupported, heating said main central portion out to said fixed peripheral portion to a formable temperature while leaving said fixed peripheral portion at a temperature at which it remains rigid to constitute a rigid rim portion and, while holding a heated portion of the blank immediately adjacent to said fixed peripheral portion substantially in the plane of said fixed peripheral portion, forming said heated main central portion into a cavity of substantial depth, said heated portion immediately adjacent to said fixed peripheral portion constituting a reservoir of formable material from which material is necked down into the cavity to preclude any discontinuity occurring between said fixed peripheral portion and the cavity wall during the cavity forming operation.



4,048,782

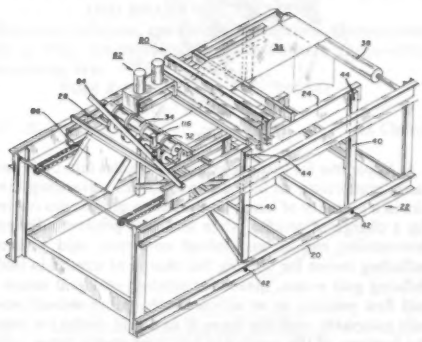
CONTROLLED FILM ADVANCE APPARATUS

Joel A. Hamilton, 101 Hardenburgh Ave., Demarest, N.J. 07627

Filed Oct. 4, 1976, Ser. No. 729,303

Int. Cl.[2] B65B *41/18*

U.S. Cl. 53—51 **19 Claims**



1. A film advancing apparatus for supplied film which is to be sealed, shaped, cut, laminated and the like during and with an intermittent advance, said apparatus including: (a) a fixed frame; (b) means for removably supporting at least one supply roll of film carried by this fixed frame; (c) a movable frame carried by the fixed frame so as to be cycled in a back and forth determined path and pattern; (d) a film feed roller carried by a shaft mounted on and movable with the movable frame and adapted to receive the film from the supply roll; (e) a one-way clutch carried by the film feed roller shaft, said clutch arranged so as to permit the film feeding roller and shaft to be turned only in a direction to move the film toward the discharge end of the apparatus; (f) a toothed member carried by the shaft carrying the film feed roller and one-way clutch; (g) a flexible drive means having one end operatively attached to the fixed

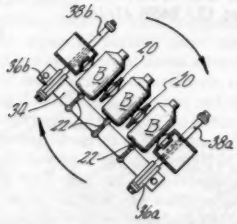
frame and the other to a take-up means adapted to maintain the flexible drive means in a taut condition and in a driving engagement with the toothed member as the movable frame is cycled back and forth; (h) an adjusting means for selectively changing the effective length of the flexible drive means in that extent of length between the end operatively fixed to the frame and the toothed member, said extent being changed in response to a signal which is actuated in response to the comparing of the actual advance of the film in relation to the desired advance of the film; (i) a pressure roller disposed to push the film being fed from the supply roll to the film feeding roller and to hold this supply film therebetween so that only a forward rotation of the film feeding roller occurs and the film is advanced therebetween and, (j) motive means for cycling the movable frame back and forth in a determined path and extent whereby the movable frame is moved from the head end and toward the discharge end of the apparatus and the film between the pressure roller and film feed roller is prevented from moving by the one-way clutch action on the feeding roller shaft and during the return stroke of the movable frame toward the head end the toothed member on the film feeding roller shaft is driven by the engaged flexible drive means to rotate the shaft and the film feeding roller to feed that film gripped between these rollers to that extent as determined by the relative rotation of the toothed member and the relative diameter of the film feeding roller.

4,048,783

CASE LOADER WITH INVERT GRID AND PUSHDOWN FEATURE

John L. Raudat, Madison, and Lloyd D. Johnson, Portland, both of Conn., assignors to Emhart Industries, Inc., Hartford, Conn.

Filed Nov. 19, 1976, Ser. No. 743,341
Int. Cl.² B65B *57/10, 35/56*
U.S. Cl. 53—61 **24 Claims**



1. Apparatus for loading groups of articles into open packing cases, comprising an infeed conveyor for advancing the articles in a plurality of lanes, lane defining grid means for receiving a charge of articles when in a first position adjacent the downstream end of said infeed conveyor, said grid means including means for holding the charge of articles in said lane defining grid means, means for rotating said grid means from said first position to an article discharge or second position, rails associated with the lanes of said grid means for engaging the bottoms of the articles in said grid means when said grid means in said first position, and means for moving said rails at least when said grid means is in its second position to push the articles out of said grid means and into a packing case.

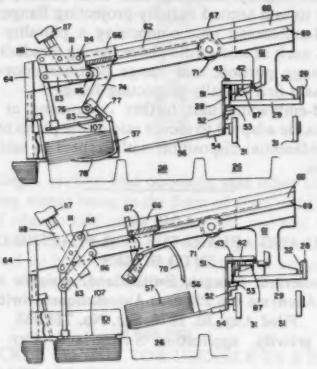
4,048,784

LOADER FOR SLICED COMESTIBLE PRODUCT

Max Edward Toby, 2265 Ocean Ave., San Francisco, Calif. 94127

Division of Ser. No. 552,851, Feb. 25, 1975, Pat. No. 3,991,685. This application July 23, 1976, Ser. No. 708,136
Int. Cl.² B65B *5/06*
U.S. Cl. 53—77 **2 Claims**

1. In a device for transferring an article from a holding station to a loading station and for loading the article into a container, including loader transfer means extending to and above the container for supporting and translating the article thereto, support means for supporting the article adjacent to the opening of the container, and plunger means for pushing said article into the container, said holding station including a first plurality of spaced tines for supporting said article; the improvement wherein said loader transfer means includes track means extending from said holding station to the container and a loader carriage translatably supported on said track means, said loader carriage including a loader pusher



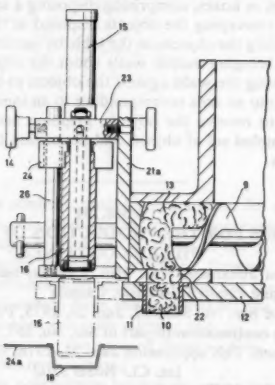
joined thereto by a pivot shaft, first means for selectively rotating said loader pusher about said shaft either to clear or engage said holding station; said loader pusher including a second plurality of spaced, parallel tines disposed to interdigitate with said first plurality of tines, with said loader pusher in the engaged position, and support and remove the article from the holding station; and means for reciprocally translating said loader carrige to deliver said article to said support means, and return.

4,048,785

APPARATUS FOR DEPOSITING FIBROUS MATERIAL INTO CONTAINERS

Edward James Wright, Peterborough, England, assignor to Baker Perkins Holdings Limited, Peterborough, England

Filed July 19, 1976, Ser. No. 706,701
Int. Cl.² B65B *63/02*
U.S. Cl. 53—122 **1 Claim**



1. Apparatus for depositing a predetermined amount of material such as meat into a container comprising a housing having a discharge opening in one side thereof, extrusion means in said housing for extruding a predetermined portion of material from a mass of material in said housing through said

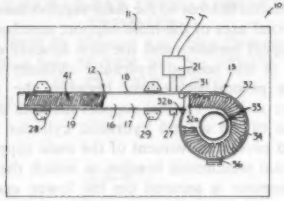
opening, slide means mounted for sliding movement across said one side of said housing between a receiving position and an ejecting position, an open ended tubular receiver mounted on said slide means to be located with one end of said receiver in sealed registry with said opening when said slide means is in said receiving position to receive said portion of material from said container means, both open ends of said receiver being exposed when said slide means is in said ejecting position, and reciprocal piston means aligned with said receiver when said slide means is in said ejecting position and movable from a retracted position spaced from one end of said receiver entirely through said receiver to a location spaced a preselected distance beyond the opposite end of said receiver to eject said portion of material from said receiver into the container, and means for adjusting the length of stroke of said piston means to establish said preselected distance.

4,048,786

CIRCULAR PACKAGE LOADER

William A. Brastad, Minneapolis, and Nelson J. Beall, St. Michael, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Sept. 25, 1975, Ser. No. 616,749
Int. Cl.² B65B *5/06, 25/00, 35/22, 67/02*
U.S. Cl. 53—159 **6 Claims**



1. Apparatus for loading a column of snack chips into a container as a loop array, said apparatus comprising:

reservoir means;

means for feeding a column of nested, uniformly shaped chips into said reservoir means, said reservoir means including means for holding said nested chips in a loop array;

means for transferring said loop array of nested chips from said reservoir means into a container while maintaining said chips in said loop array;

said reservoir means including means for assisting in movement of said column into a loop array orientation as said nested chips are fed into said reservoir means, said assisting means including an arcuate reservoir side wall.

4,048,787

COMBINATION CLUTCH AND BRAKE FOR ROTARY POWER MOWER

Joseph R. Harkness, Germantown, and Daniel E. Braun, Brookfield, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed July 1, 1976, Ser. No. 701,619
Int. Cl.² A01D *69/10*
U.S. Cl. 56—11.3 **11 Claims**

1. In a rotary power lawn mower having a chassis with a substantially horizontal deck, a prime mover on the deck, and a rotary blade fixed to a spindle that is drivingly connected with the drive shaft of the prime mover,

the improvement whereby rotation of the blade can be abruptly stopped concomitantly with disconnection thereof from the drive shaft of the prime mover,

said improvement comprising the combination of:

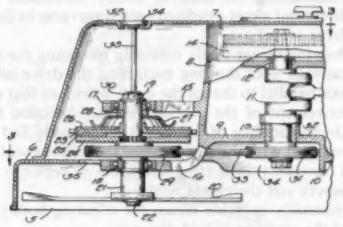
A. bearing means fixed with respect to the deck of the chassis and the prime mover, with the axis thereof vertical and spaced laterally from the drive shaft;

B. a spindle journaled in said bearing means with the lower portion thereof beneath the deck and having the blade fixed thereto;

C. a disengageable clutch through which the spindle is drivingly connectable with the drive shaft

D. a brake for stopping rotation of the spindle, comprising

1. frictionally engaged complementary fixed and free brake elements encircling the spindle, the fixed brake element having a torque transmitting connection with the spindle and the free brake element having no torque transmitting connection with the spindle except



through its frictional engagement with the fixed brake element, and

2. brake applying means operable to abruptly stop rotation of the free brake element;

D. means interconnecting said brake applying means and said disengageable clutch, whereby application of the brake is concomitantly accompanied by disengagement of the clutch and vice versa; and

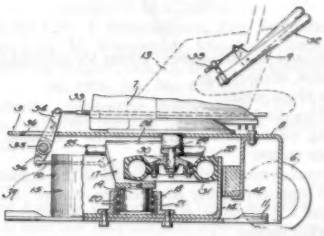
E. control means operatively connected with said interconnecting means and through which concomitant functioning of said brake and clutch may be manually controlled.

4,048,788

ROTARY POWER MOWER WITH IMPROVED CLUTCH AND BRAKE MECHANISM

Igor Kamlukin, Mequon, and Joseph R. Harkness, Germantown, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed July 9, 1976, Ser. No. 703,843
Int. Cl.² A01D *69/08*
U.S. Cl. 56—11.3 **12 Claims**



1. In a rotary power lawn mower having a wheeled chassis with a deck, a prime mover mounted on the deck with a drive shaft thereof projecting downwardly into the space below the deck, and a rotary cutter blade below the deck, improved

clutch mechanism for drivingly connecting the cutter blade with said drive shaft, comprising:

A. a drive wheel drivingly connected with and driven by said drive shaft, said drive wheel being located below the deck of the chassis and constrained to rotate about a substantially vertical axis that is fixed with respect to the chassis;

B. a ring fixed with respect to the cutter blade, said ring having internal and external circular surfaces, the diameter of each of which is larger than that of the drive wheel;

C. a carriage;

D. means movably mounting said carriage on the chassis and constraining the same to bodily movement in opposite directions along a defined path transverse to the axis of the drive wheel;

E. bearing means freely rotatably mounting the ring on said carriage with the ring encircling the drive wheel and its axis parallel to that of the drive wheel, so that upon bodily movement of the carriage in one direction the internal circular surface of the ring is tangentially and frictionally engaged with the periphery of the drive wheel to establish a torque transmitting connection between the prime mover and the cutter blade; and

F. manually operable means for effecting bodily movement of the carriage in said direction.

4,048,789

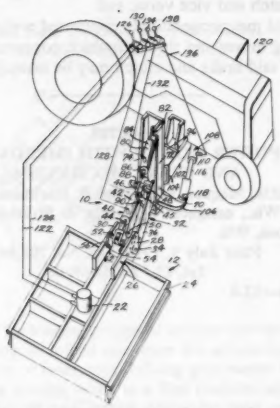
MOWER ATTACHMENT FOR TRACTORS

Jack O. Cartner, 1005 N. 8th St., Cambridge, Ohio 43725

Filed July 9, 1976, Ser. No. 704,071

Int. Cl.[2] A01D *35/26*

U.S. Cl. 56—11.9 **5 Claims**



1. A mower and attachment means for attaching the mower to a tractor, comprising:

rotary blade means;

motor means for rotating the blade means;

housing means for encompassing the rotational path of the blade means;

first bracket means rigidly secured to the housing means;

a main support member attached for relative pivotal rotation about a horizontal axis at one end thereof to the first bracket means;

first hydraulic cylinder means secured for relative pivotal rotation about a horizontal axis at one end thereof to an end of the main support member opposite the one end of the main support member;

second bracket means secured for relative pivotal rotation about a horizontal axis at one end thereof to the first bracket means about the pivotal axis between the main support member and the first bracket means, and said second bracket means being secured for relative pivotal rotation about a horizontal axis at an end opposite the one end thereof to an end of the first hydraulic cylinder means opposite the one end of the first hydraulic cylinder means so that action of the first hydraulic cylinder means will cause relative pivotal movement between the first and second bracket means;

third bracket means secured for relative pivotal rotation about a horizontal axis at one end thereof to the one end of the main support member at a position inwardly from the pivotal axis between the main support member and the first bracket means, and said third bracket means being secured for relative pivotal rotation about a horizontal axis at an end opposite the one end thereof to the opposite end of the first hydraulic cylinder means and having the same pivotal axis as the second bracket means and the first hydraulic cylinder means so that action of the first hydraulic cylinder means causes relative pivotal movement between the first and third bracket means such that contraction of the first hydraulic cylinder means causes upward pivotal movement of the housing means;

a vertical support member, to a lower end of which the main support member is secured for relative pivotal rotation about a horizontal axis at an end of the main support member opposite the one end thereof;

second hydraulic cylinder means secured for relative pivotal rotation about a horizontal axis at one end thereof to an upper end of the vertical support member and secured for relative pivotal rotation about a horizontal axis at an opposite end thereof to the main support member between the pivotal axes of the main support member to the vertical support member and the first bracket means so that action of the second hydraulic cylinder means causes relative pivotal movement between the main support member and the vertical support member such that contraction of the second hydraulic cylinder means causes upward pivotal movement of the main support member;

a horizontal attachment bracket to which the vertical support member is secured on the lower end thereof for relative pivotal rotation about a vertical axis;

third hydraulic cylinder means secured for pivotal rotation about a vertical axis at one end thereof to the horizontal attachment bracket remote from the connection of the vertical support member to the horizontal attachment bracket, an opposite end of the third hydraulic cylinder means being secured for pivotal rotation about a vertical axis to the lower end of the vertical support member so that action of the third hydraulic cylinder means causes relative pivotal movement of the vertical support member and the horizontal attachment bracket such that contraction of the third hydraulic cylinder means causes pivotal movement of the housing means in a horizontal plane; and

means for rigidly securing the horizontal attachment bracket to a tractor.

4,048,790

AGRICULTURAL IMPLEMENTS

Petrus Wilhelmus Zweegers, Nieuwendijk 46, Geldrop, Netherlands

Filed May 31, 1974, Ser. No. 475,255

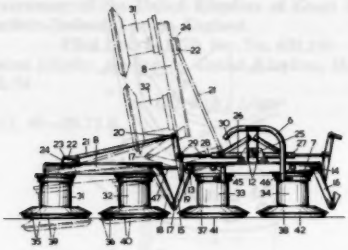
Claims priority, application Netherlands, June 14, 1973, 7308309

Int. Cl.[2] A01D *35/264*

U.S. Cl. 56—13.6 **12 Claims**

1. An agricultural implement hving a substantially horizontal frame beam extending tranversely to the direction of movement of the implement and comprising a plurality of frame beam sections, said frame beam sections having work performing elements thereon having crop or ground engaging ends such as rotary mowing elements, said crop or ground ends of the work performing elements being disposed at a substantial distance from and below said frame sections, arms extending obliquely downwardly from the adjacent ends of adjacent ones of said frame sections and pivotal connections on said arms to connect pivotally said frame beam sections, said pivotal connections of the frame beam sections being disposed from said frame beam sections by approximately said substantial distance

and located at substantially the level of the crop or ground engaging ends of the work performing element so that the work performing elements will follow surface undulations of



the field being worked without change in the spacing between adjacent work performing elements on said adjacent end of said frame beam sections during mutual pivotal movements of said sections.

4,048,791

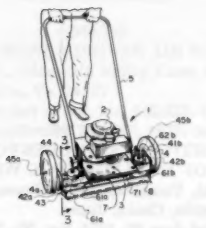
REVERSIBLE SICKLE-BAR TYPE LAWN MOWER AND TRIMMER

J. Paul Treen, 5025 St. Bernard Ave., New Orleans, La. 70122

Filed June 18, 1976, Ser. No. 697,474

Int. Cl.[2] A01D *35/12*

U.S. Cl. 56—17.6 **9 Claims**



1. A combined lawn mower and trimmer comprising:

a basic lawn mower support structure;

a cutting blade bar elongated in structure mounted on the underside of said mower support structure;

mounting and drive means connected to said support structure and said blade bar for mounting said blade bar onto said support structure and for driving said blade bar in a combined laterally reciprocating and longitudinally orbital motions in a generally horizontal plane, said blade bar being double-edged, having cutting edges on both of its long edge portions, said blade bar exhibiting a sliding cutting action while it is being laterally reciprocated and a chopping cutting action when it is being orbitally moved in the longitudinal direction;

ground contacting wheel means connected to said support structure for supporting said support structure and said blade bar above the ground; said blade bar in its travel being located at least generally under said support structure and at least generally to one side of said wheel means but extending past said support structure at only one longitudinal end thereof, the opposite end of said support structure extending substantially past said blade bar;

a handle connected to and extending past said basic support structure and being reversibly movable from one of its longitudinal ends to the other, the mower being movable and operational in either longitudinal direction, one for regular mowing and the other for close-in trimming; and guard means positioned about said blade bar at least at the area it extends past said support structure.

4,048,792

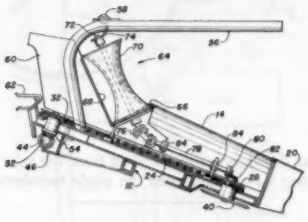
ROW CROP MEANS FOR A HARVESTING UNIT

Joe E. Shriver, and Donald O. Norman, both of East Earl, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 11, 1976, Ser. No. 713,327

Int. Cl.[2] A01D *45/02*

U.S. Cl. 56—98 **19 Claims**



1. In a row crop means for a mobile harvesting unit adapted to advance over a field of crop planted in rows, said means including a frame, laterally spaced generally fore-and-aft gathering members mounted on the frame defining at least one elongated fore-and-aft passageway adapted to receive a row of crop as the unit advances, each of said gathering members adapted to move crop rearwardly along the passageway to feed the crop to said unit, at least one of said gathering members having a relatively smooth upwardly and rearwardly inclined top surface adapted to slideably engage down crop as the unit advances, the improvement comprising: a rotary member disposed in a rear portion of at least one of said gathering members for assisting in the feeding of said down crop being draped over said member to said unit, said at least one gathering member having a cut-away portion on the rearward end thereof forming a recess area for positioning said rotary member such that the lower portion of said rotary member forms a substantially continuous path extending from said top surface of said at least one gathering member for the sliding of said draped-over crop rearwardly and upwardly from said member and onto said rotary member.

4,048,793

RAKING MACHINE

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland, and Ary van der Lely, 10, Weverskade, Maasland, Netherlands

Division of Ser. No. 514,309, Oct. 11, 1974. This application Jan. 30, 1976, Ser. No. 653,730

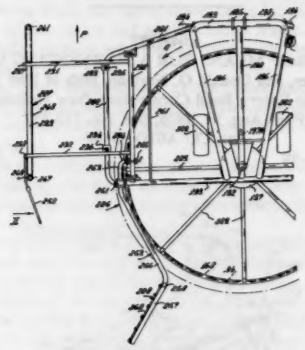
Claims priority, application Netherlands, Oct. 12, 1973, 7314028; Feb. 18, 1974, 7402172; Jan. 18, 1974, 7400685; June 19, 1974, 7408181

Int. Cl.[2] A01D *77/05*

U.S. Cl. 56—370 **16 Claims**

1. A raking machine comprising a frame movable over the ground and at least one rake member supported on said frame, said rake member being rotatable about an upwardly extending axis of rotation to define a working width and driving means connected to said member to rotate same, crop displacing tine means mounted around the perimeter of said rake member, first and second guide members connected to said frame and being positioned to form a swath of crop to one side to the rake member, the first guide member being positioned laterally of the working width of said rake comprising elongated screen means that extends in the general direction of travel of said machine, the second guide member being positioned to the rear of said first guide member and adjacent the working width of

the rake member to the rear thereof, said guide members being laterally spaced apart from one another and positioned to



confine the displaced crop received from the rake head at said one side into a swath between the guide members.

4,048,794

SEALED CABLES FOR ATTACHMENT TO SUBMARINE ANCHORAGES

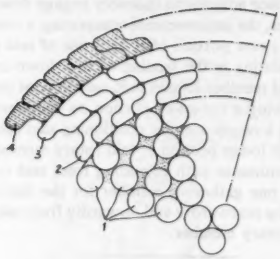
Bernard Charles Albert Falcy, and Adrien Vaudant, both of Bourg-En-Bresse, France, assignors to Societe Anonyme des Hauts Fourneaux de la Chiers, Longwy-Bas, France

Filed May 10, 1976, Ser. No. 684,831

Claims priority, application France, May 27, 1975, 75.16403

Int. Cl.[2] H01B *1/02, 7/28*

U.S. Cl. 57—149 **8 Claims**



1. Sealed cable for submarine anchorages which comprises a central core, at least one intermediate layer of metallic wires having a Z-shaped cross-section, and a peripheral cathodic protective layer made of metallic wires having a Z-shaped cross-section formed from a metal more electronegative than the metal of the wires of said intermediate layer.

4,048,795

TIMEPIECE CALENDAR MECHANISM

Rene Risi, Berne, Switzerland, assignor to Bulova Watch Company, Inc., Flushing, N.Y.

Filed Nov. 4, 1975, Ser. No. 628,470

Claims priority, application Switzerland, Nov. 6, 1974, 14824/74

Int. Cl.[2] G04B *19/24*

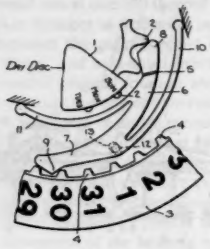
U.S. Cl. 58—4 R **4 Claims**

1. In a calendar mechanism for a timepiece, the combination comprising:

A. a date ring having a circular set of internal gear teeth;

B. a day disc disposed within the interior space of the date ring and concentric therewith, said day disc having a circular set of external gear teeth; and

C. a double-acting twin jumper pivotally mounted between the two sets of teeth, the pivot of said jumper allowing for a limited degree of shifting movement, said jumper being formed by two oppositely-directed lever arms extending from either side of said pivot, each arm having a detent at the free end thereof engaging a respective set of teeth and



being angled in the same direction as the section of teeth in the set adjacent thereto, each arm having integral therewith a biasing spring whose free end rests against a fixed element to maintain the position of said jumper between said two sets of teeth.

4,048,796

TOUCH SENSITIVE ELECTRODES FORMED ON THE FRAME OF AN ELECTRONIC WRISTWATCH

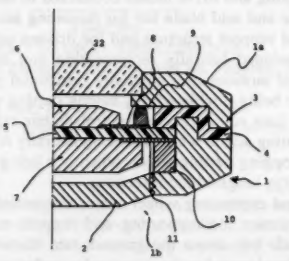
Takehiko Sasaki, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed June 30, 1976, Ser. No. 701,204

Claims priority, application Japan, June 30, 1975, 50-91924[U]; Nov. 14, 1975, 50-155710[U]

Int. Cl.[2] G04B *37/00*; G04C *3/00*

U.S. Cl. 58—23 R **6 Claims**



1. In an electronic timepiece including a front metal casing, a rear metal casing and a touch sensitive electronic switching circuitry, the improvement comprising:

an insulating ring for electrically isolating the front metal casing from the rear metal casing; and

a connection means for electrically connecting the front metal casing to an input terminal of the touch sensitive electronic switching circuitry.

4,048,797

COMBUSTION APPARATUS

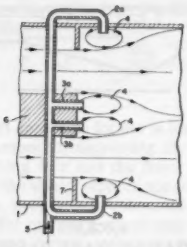
John Philip Dabbs Hakluytt, Botley, near Southampton, and John Ronald Tilston, Farnham, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Dec. 5, 1975, Ser. No. 638,106

Claims priority, application United Kingdom, Dec. 6, 1974, 52934/74

Int. Cl.[2] F02G *1/00*

U.S. Cl. 60—39.72 R 7 Claims



1. Combustion apparatus comprising a duct for conveying a stream of combustion supporting gas, means located within said duct providing a recirculatory flow of said gas which defines a flame stabilisation zone, and a source of fluid comprising an inert diluent connected to said duct for supplying said stabilisation zone with said inert diluent.

4,048,798

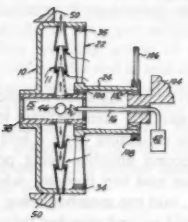
SUCTION POWER-DRIVEN AIR TURBINE

John S. Larkins, Jr., Mountain Valley Farm, Star Rte. No. 5, Box 60, New Castle, Va. 24127

Continuation-in-part of Ser. No. 618,623, Oct. 1, 1975, abandoned. This application Nov. 12, 1975, Ser. No. 631,040

Int. Cl.[2] F15B *15/18*

U.S. Cl. 60—407 25 Claims



25. An engine comprising:

means defining a first chamber;

a turbine wheel mounted for rotation in said chamber, said turbine wheel having one side in communication with ambient air and the other in communication with the interior of said chamber; and

means operably connected in said first chamber for reducing the pressure level thereof to a magnitude below ambient pressure level whereby the resultant airflow between ambient and such chamber effects the driven rotation of such turbine wheel;

said first chamber further including a combustion chamber mounted therein and having a burner means, said pressure reducing means comprising a series of staged venturies communicating between said combustion chamber and ambient and extending through said first chamber;

said staged venturis extending radially in a plurality of branches from said combustion chamber to ambient.

4,048,799

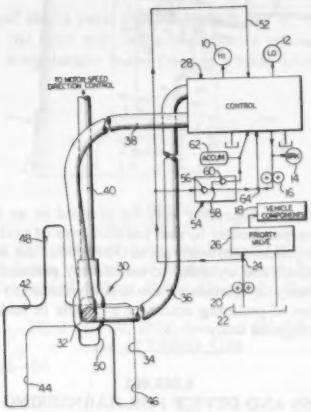
WINCH CONTROL

Kenneth F. Golan, Pekin, and James E. Winzeler, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 17, 1976, Ser. No. 742,966

Int. Cl.[2] F15B *1/02, 11/16*

U.S. Cl. 60—413 8 Claims



1. In a control for a hydraulically operated winch or the like having a hydraulically disengaged brake, and a multispeed, hydraulically controlled transmission and a drum to be driven or braked, the combination of:

a brake control valve having an inlet, an outlet and selectively variable metering valve means between said inlet and outlet;

a metering pump adapted to be operatively associated with a winch drum so as to be driven thereby;

a first fluid conduit extending from said outlet to said metering pump;

a port in said first fluid conduit adapted to be coupled to said hydraulically disengaged brake for the winch;

a second fluid conduit extending from said metering pump to said inlet; and

a source of fluid under pressure connected to said inlet.

4,048,800

HYDRAULIC JACK HAVING ROTATING PUMP HANDLE

Philip S. Cancilla, 342 Ann Darling Drive, San Jose, Calif. 95133

Filed July 14, 1975, Ser. No. 595,866

Int. Cl.[2] F15B *15/18*

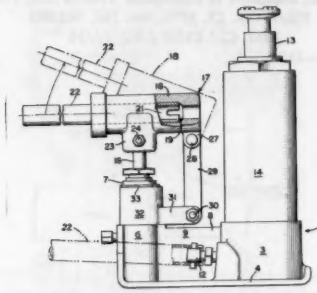
U.S. Cl. 60—477 2 Claims

1. In combination with a hydraulic jack structure having a main cylinder symmetrical about a longitudinal axis and a ram movable therewithin by hydraulic fluid and a pump assembly including a pump cylinder and a pump shaft symmetrical about a longitudinal axis and axially displaceable therewithin to pump fluid from within said pump cylinder into said main cylinder by axial displacement of said pump shaft, a pump handle assembly, comprising:

a. an elongated body having a socket therein adapted to receive a handle and pivotally connected to said pump shaft;

b. link means pivotally connected at one of its ends to said elongated body; and

c. means providing horizontal rotation of said pump handle, said means including parallel longitudinal axes of said main cylinder and said pump cylinder and further including means rotatably mounted on said pump cylinder in coaxial relation with said pump shaft and pivotally connected to the other end of said link means whereby said



pump handle assembly may be pivoted in an horizontal plane perpendicular to said parallel axes of said main and pump cylinders through about 320° about the axis of said pump shaft and cylinder to selectively position the elongated body in relation to the main cylinder to avoid obstruction of pumping action of a handle in said socket in said elongated body.

4,048,801

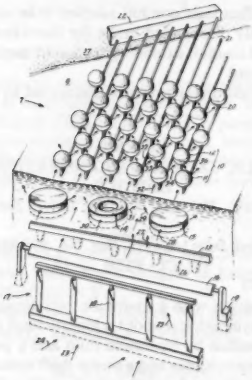
PROCESS AND DEVICE FOR HARNESSING WAVE ENERGY

Michael G. Tornabene, 285 Oak Neck Lane, West Islip, N.Y. 11795

Continuation-in-part of Ser. No. 428,349, Dec. 26, 1973, abandoned, and Ser. No. 432,211, Jan. 10, 1974, abandoned, and Ser. No. 566,985, April 10, 1975, and Ser. No. 566,983, April 10, 1975, and Ser. No. 566,984, April 10, 1975. This application Apr. 11, 1975, Ser. No. 567,127

Int. Cl.² F03G 7/10

U.S. Cl. 60—502 **9 Claims**



1. A process for harnessing energy comprising in combination: employing in water, a plurality of float means in a predetermined pattern of positioning individual ones of said plurality relative to one another in off-set spaced-apart predetermined relationships to one-another at predetermined distances from one-another with a first one being obliquely rearwardly spaced relative to a second one and relative to a direction of substantially lineal direction of primary pressure movements of a body of water, said predetermined distances being within a range of dimensions sufficiently small and sufficiently great such that a first pressure energy wave within the body deflects obliquely and at least one of rearwardly and forwardly from said second one of said plurality to thereafter impel against said first one of said plurality at least in part coincident with another pressure energy wave within said water, each float means being of a predetermined shape and positioned such that the first pressure wave is deflected obliquely in the direction of a rearward float whereby the remaining energy of the wave may be utilized.

4,048,802

FLOATING WAVE BARRIER

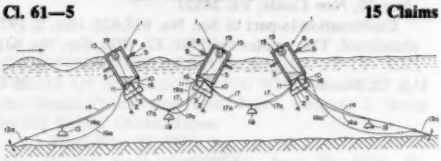
Wallace William Bowley, Stafford Springs, Conn., assignor to William Barney Ritchie, Jr., Duxbury, Mass., a part interest

Continuation-in-part of Ser. No. 485,831, July 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 383,346, July 27, 1973, Pat. No. 3,848,419, which is a continuation-in-part of Ser. No. 357,938, May 7, 1973, Pat. No. 3,846,990, which is a continuation-in-part of Ser. No. 267,086, June 28, 1972, abandoned. This application Feb. 14, 1975, Ser. No. 550,118

The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.

Int. Cl.² E02B 3/04

U.S. Cl. 61—5 **15 Claims**



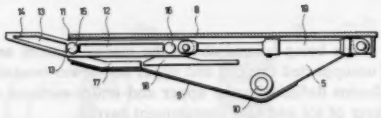
1. A wave barrier having a top member and a second member attached to said top member, said top member having at least one annulus extending from a body portion of said top member, said second member being positioned at a deeper water depth than said top member when said barrier is anchored in water, said top member being located at or near the water surface, said second member being submerged near the water surface, the masses and specific gravity of the top member, annulus and second member being controlled so that the top member and second member are maintained generally along a common vertical axis with respect to each other when placed in water, said barrier being anchored to the sea bottom by a flexible line extending from an anchor to a point at or near to an axis of pitch of said top member in order to maximize oscillation of said top member about said axis of pitch and so that said annulus causes formation of wave fronts to contact incoming waves to reduce a vertical wave velocity component of the incoming waves and without substantial contact of said members, said axis of pitch being determined under the average expected wave condition in the water, and said axis of pitch being oriented in a direction generally perpendicular to the direction of movement of incoming waves toward the shore when said barrier is anchored in water.

4,048,803

MINING SHIELD SUPPORT APPARATUS

Karoly Bole; Kalman Nagy, both of Varpalota; Istvan Aufsatz, Budapest; Jozsef Bohnert, Budapest; Laszlo Branyi, Budapest; Zoltan Ilyes, Budapest; Jozsef Korbuly, Budapest, and Janos Nemeth, Budapest, all of Hungary, assignors to Banyaszati Kutato Intezet, Hungary

Filed Jan. 17, 1975, Ser. No. 531,165
Claims priority, application Hungary, Dec. 3, 1974, BA 3007
Int. Cl.[2] E21D *17/02*
U.S. Cl. 61—45 D 1 Claim



1. Shield support apparatus for use in long wall mining with a roof support member for supporting the portion of the roof between the working face and the front edge of a roof cap before advancing the shield support apparatus, said apparatus comprising a base, prop means connected to the base, a roof cap, pivot means for pivotally connecting the roof cap to the base and to the prop means, a roof support member, guides located in the sides of the roof cap, guide-engaging members for mounting the roof support member between said guides for movement in the longitudinal axial direction of the roof cap between an inoperative position wherein the roof support member is retracted in the roof cap and an operative position wherein said roof support member is extended forwardly of the front edge of the roof cap, and drive means for effecting said movement of the roof support member, said guides comprising, on each side of the roof cap, at least two tracks engaged by corresponding ones of said guide-engaging members carried by the roof support member, each said track comprising a first track portion substantially parallel to the plane of the roof cap and a second track portion disposed forwardly of said first and inclined forwardly and upwardly to form a ramp, said roof member being pivotally connected to said drive means for effecting movement of the roof support member so that when said roof member is moved by said drive means, said roof member moves from said inoperative position upwardly along said ramps of said first and second track portions to the operative position wherein the roof supporting surface of said roof support member is parallel to the upper surface of the roof cap, whereby a full surface wedging action of the roof support member against the roof is achieved in said operative position, said track portions being formed by two pairs of track members, one of said pairs being located adjacent the working face side of the roof cap and the other of said pairs being located adjacent the pivotal connection of the roof cap, the track members of said one pair being farther apart than the track members of said other pair.

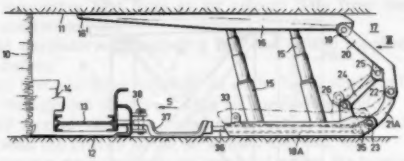
4,048,804

SUPPORT ASSEMBLIES FOR USE IN MINE WORKINGS

Burckhardt Elsner; Lubomir Plevak; Günter Lagodka, all of Lunen, and Harry Rosenberg, Ludinghausen, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Filed Sept. 8, 1976, Ser. No. 721,636
Claims priority, application Germany, Sept. 9, 1975, 2540091
Int. Cl.[2] E21D *15/44*
U.S. Cl. 61—45 D 12 Claims

1. A support assembly for use in a mine working; said assembly comprising: separate floor-engaging sills, at least one extendible prop carried by each of said sills, a common upper goaf shield, a roof cap, means pivotably connecting the upper goaf shield to the roof cap, the props being operable to raise and lower the roof cap and the upper goaf shield, plural linkage means each pivotably interconnecting the upper goaf shield to a respective one of the floor sills, lower goaf shield parts, means pivotably connecting the lower goaf shield parts to the upper shield and means pivotably connecting each of the



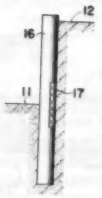
lower goaf shield parts to a respective one of the floor sills whereby the floor sills can move relative to one another to adjust to irregularities in the floor of a mine working.

4,048,805

CONCRETE PILE

Yoshikiyo Fukushima, Tokyo, and Shigeru Watanabe, Suita, both of Japan, assignors to Nippon Concrete Industries Co. Ltd., Tokyo and Nikkai Giken Co., Ltd., Osaka, both of Japan

Filed Jan. 20, 1976, Ser. No. 650,790
Int. Cl.[2] E02D *5/30*
U.S. Cl. 61—56 7 Claims



1. A cylindrical concrete pile, with a steel plate of a semi-cylindrical shape integrally fixed in the outer peripheral surface at a predetermined position, along the length of said pile, the length of said steel plate being substantially less than the length of said concrete pile, said steel plate having a suitable number of connectors protruding beyond the inner surface thereof in such a manner that the said connectors thrust into and adhere in said concrete.

4,048,806

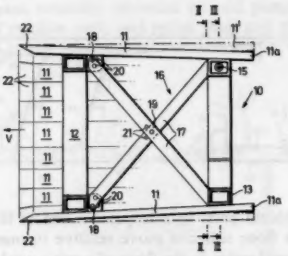
APPARATUS FOR, AND A METHOD OF, DRIVING TUNNELS

Dieter Stuckmann, Selm; Siegmund Babendererde, Bad Vilbel; Hans Jütte, Dortmund-Brechten, and Reinhard Bokemeyer, Offenbach, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen and Hochtief A.G., Frankfurt, both of Germany

Filed May 10, 1976, Ser. No. 684,826
Claims priority, application Germany, May 10, 1975, 2520915
Int. Cl.[2] E21D *9/06*
U.S. Cl. 61—85 16 Claims

1. Tunnel driving apparatus having a shield composed of a plurality of elongate drive members arranged in side-by-side supporting and guiding all the members for longitudinal dis-

placement and adjustable means on part of said support means for varying the angular relationship between the individual



longitudinal axes of all the members and the tunnel axis in unison.

4,048,807

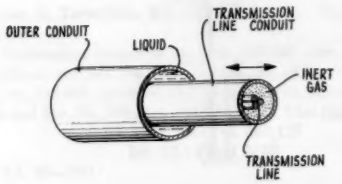
METHODS FOR EMPLACING AND MAINTAINING TRANSMISSION LINES

Fred S. Ellers, Menlo Park; Hugh G. Hally, San Mateo, both of Calif.; Edward E. McIlveen, Upper Montclair, N.J., and William A. Doble, San Mateo, Calif., assignors to Bechtel International Corporation, San Francisco, Calif. and The Okonite Company, Ramsey, N.J.

Continuation of Ser. No. 545,214, Jan. 29, 1975, abandoned. This application June 18, 1976, Ser. No. 697,412

Int. Cl.[2] F16L *1/02*

U.S. Cl. 61—105 **6 Claims**



1. A method for emplacing and maintaining a transmission line between two distant points comprising the steps: forming a first conduit between two distant points; filling said first conduit with a liquid; inserting a transmission line conduit into and through said first conduit, said transmission line conduit containing an electrical transmission line and an inert gas, the weight to volume ratio of the transmission line and contents being substantially equal to the density of the liquid within the first conduit, whereby the liquid filling said first conduit provides sufficient buoyancy and lubrication to float the transmission line conduit and contents axially through the first conduit; then substituting the inert gas within said transmission line conduit with an electrical insulating liquid, thereby decreasing the buoyancy of said transmission line conduit and contents.

4,048,808

ICE ISLANDS AND METHOD FOR FORMING SAME

Frederick C. Duthweiler, Anchorage, Alaska, assignor to Union Oil Company of California, Brea, Calif.

Filed Apr. 19, 1976, Ser. No. 678,317

Int. Cl.[2] E02B *3/00*; **F25C** *1/02*

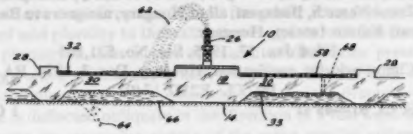
U.S. Cl. 61—103 **12 Claims**

1. An ice island for conducting offshore operations in a frigid environment, said ice island comprising:

an ice mass defining an operations pad, the base thereof being supported on the marine bottom at a desired operations site;

an ice structure defining a containment barrier surrounding said operations pad and spaced outwardly therefrom, the base of said containment barrier being also supported on the marine bottom;

a layer of ice disposed in the space between said operations pad and said containment barrier, the undersurface of said



layer of ice being spaced above the marine bottom and being unsupported thereby and upper and lower containment basins defined by the upper and under surfaces of said layer of ice and said containment barrier.

4,048,809

AIR CONDITIONING

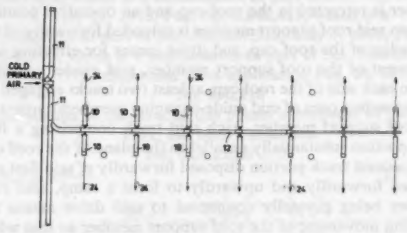
Robert Sidney Simmons, Pinner, England, assignor to Casaire Limited, England

Filed Dec. 2, 1975, Ser. No. 636,902

Claims priority, application United Kingdom, Dec. 2, 1974, 52089/74

Int. Cl.[2] F25D *17/06*; **F25B** *41/00*; **F24F** *7/00, 13/00*

U.S. Cl. 62—89 **13 Claims**



1. A method of cooling a space comprising providing tubular venturi mixing devices or diffusers having primary air nozzles, bell-mouthed secondary air inlets, and outlets for discharging mixed primary and secondary air into said space, said nozzles being disposed at the entrances of the secondary air inlets, and said mixing devices or diffusers and the inlets thereof being disposed at high level within the space; cooling a supply of primary air to a temperature substantially below a desired temperature of the space; distributing the so-cooled primary air to said nozzles into said secondary air inlets; inducing with said jets flows of secondary air from the high level in the space directly into the inlets; and forming a mixture of said primary air and secondary air in the devices or diffusers in which the volume of secondary air represents at least 50% of the total volume of mixed primary and secondary air discharged into the space through said outlets.

4,048,810

REFRIGERATING PROCESS AND APPARATUS THEREFOR

Sten Olof Zeilon, Heimdalsgatan 21, 260 14 Glumslov, Sweden

Filed Apr. 20, 1976, Ser. No. 678,489

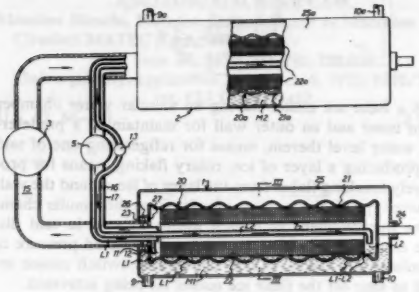
Claims priority, application Sweden, Apr. 28, 1975, 7504890

Int. Cl.[2] F25B *15/00*

U.S. Cl. 62—101 **19 Claims**

1. A refrigerating process according to the compression-absorption method in which use is made of apparatus comprising a gas evaporator and a gas absorber connected to each other by gas and solution circuit means in a closed system,

comprising the steps of (a) feeding in a closed cycle a solution enriched by gas from the absorber (2) to the evaporator (1); (b) supplying heat to said enriched solution in the evaporator for evaporating gas therefrom and producing a gas impoverished solution; (c) feeding said enriched solution to the evaporator; (d) withdrawing evaporated gas from the evaporator and increasing the pressure thereof; (e) introducing said pressure increased gas into the absorber and removing heat from said gas impoverished solution introduced into the absorber under conditions which will ensure therein a higher pressure level than in the evaporator and a lower average temperature of the impoverished solution introduced thereinto than the average



temperature of the enriched solution introduced into the evaporator for effecting gas dissolution in the former and gas evaporation from the latter solution, respectively; (f) effecting increase of the temperature of the enriched solution which is fed from the absorber and is introduced into the evaporator and a proportional increase of the temperature of the impoverished solution which is fed from the evaporator and introduced into the absorber by leading said solutions in countercurrent heat exchanging relationship before admixing the enriched solution with solution which is under gas evaporating conditions in the evaporator and admixing of the impoverished solution with the solution which is under gas absorbing conditions in the absorber.

4,048,811

COMBINATION OF AIR CONDITIONER AND VENTILATING UNIT PROVIDED WITH TOTAL HEAT EXCHANGER ASSEMBLY

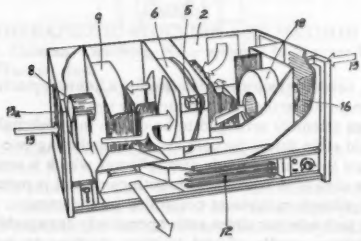
Tadashi Ito, Nara; Katuhiro Wakahara, Tenri, and Masao Tatsuoka, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 25, 1976, Ser. No. 670,103

Claims priority, application Japan, Mar. 28, 1975, 50-38844; Mar. 28, 1975, 50-38845; Mar. 28, 1975, 50-38848; June 9, 1975, 50-69837

Int. Cl.² F25D *23/12, 17/06;* F24F *13/00*

U.S. Cl. 62—263 **11 Claims**



1. A combination air conditioner and ventilator comprising:

an air conditioner unit including an air inlet and a supplied air outlet;

a ventilator unit mounted adjacent the air conditioner unit and provided with a total heat exchanger assembly for recovering heat from an air exhaust flow from the air conditioner unit;

said ventilator unit including first and second supplied air outlets;

said first ventilator supplied air outlet being separate from the supplied air outlet of the air conditioner unit;

said second ventilator supplied air outlet communicating with the interior of the air conditioner unit; and

a damper means operatively provided within the interior of the ventilator unit for directing the ventilator supplied air flow between said first ventilator supplied air outlet and said second ventilator supplied air outlet.

4,048,812

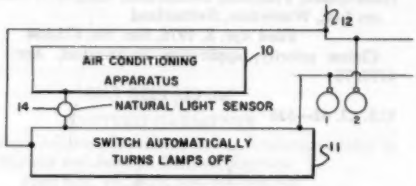
SOLAR-ENERGY CONSERVING

Harry E. Thomason, 609 Cedar Ave., Fort Washington, Md. 20022

Filed Feb. 17, 1976, Ser. No. 658,752

Int. Cl.² F25D *25/00*

U.S. Cl. 62—264 **7 Claims**



1. Energy-conserving apparatus comprising first means for air-conditioning an area, second means for illuminating said area, and third means interconnecting said first means and said second means to conserve energy by automatically reducing the level of illumination and energy consumption of said second means when said first means is energized and to reduce the heat energy output of said second means to thereby reduce the heat load on said first means.

4,048,813

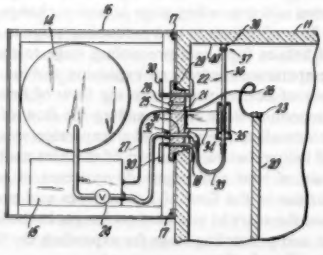
DETACHABLE CONTAINER REFRIGERATION SYSTEM

Henry Joseph Falk, Grand Island, N.Y., and Gerald Charles Tocci, Morrestown, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 11, 1975, Ser. No. 586,100

Int. Cl.² F25D *19/00*

U.S. Cl. 62—297 **5 Claims**



2. In apparatus for refrigeration of stored product within a portable thermally insulated shipping container having at least one porthole therein, a porthole closure assembly for gas

tightly sealing said porthole, a liquified gas refrigerant storage tank with associated flow control means, refrigerant dispensing and flow control means joined to said storage tank and said porthole closure assembly, and refrigerant spray means joined to said dispensing and flow control means through said porthole closure assembly for controllable refrigeration of said stored product, the improvement comprising: a support-refrigerant dispensing assembly joined to the inner side of said porthole closure assembly and having a base section; an upwardly extending fluid conduit joined to said base section for vertical movement; spray nozzle means joined to the fluid conduit upper end; thrust member means joined to said fluid conduit for vertical movement; mechanical compression exerting means positioned against said fluid conduit for upward urging thereof; said base section, fluid conduit, compression means and thrust member being sized and arranged for upward urging of said thrust member against the container ceiling when said porthole closure member is attached to said container so as to seal said porthole.

4,048,814

REFRIGERATING PLANT USING HELIUM AS A REFRIGERANT

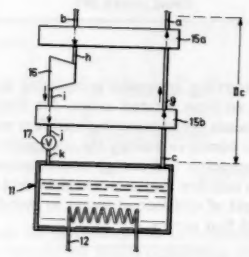
Hans Quack, Pfaffikon, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Apr. 8, 1976, Ser. No. 675,064

Claims priority, application Switzerland, Apr. 15, 1975, 4777/75

Int. Cl.² F25B *7/00*

U.S. Cl. 62—335 **7 Claims**



1. A refrigerating plant having a helium circuit in which helium circulates as a refrigerant, said plant comprising

a precooling stage to precool a flow of helium to a temperature below the inversion temperature thereof with the performance of work, said stage including means for compressing the flow of helium and means for cooling the compressed flow of helium;

a Joule/Thomson stage including a pair of heat exchangers interposed in said helium circuit to place a flow of helium from said precooling stage in heat exchange relation with a flow of helium to said precooling stage to cool the flow of helium from said precooling stage to the liquefaction temperature thereof, an expansion turbine between said pair of heat exchangers in the flow of helium from said precooling stage for expanding the flow of helium to an intermediate pressure, and an expansion means in the flow of helium between the exit of the heat exchanger of said pair of heat exchangers downstream of said expansion turbine in the flow of helium from said precooling state and the entry to said heat exchanger in the flow of helium to said precooling stage for expanding the flow of helium to a liquefaction pressure; and

a cryogenic load for supplying heat to the flow of helium, said load being disposed between said exit and said entry of said heat exchanger in the flow of helium.

4,048,815

FLAKE ICE MAKER

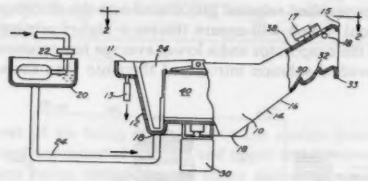
Theodore Kattis, 1315 Estes St., Lakewood, Colo. 80215

Division of Ser. No. 502,031, Aug. 30, 1974, Pat. No. 3,921,415.

This application Oct. 28, 1975, Ser. No. 626,363

Int. Cl.² F25C *1/14*

U.S. Cl. 62—354 **4 Claims**



1. In a flake ice maker having an annular water chamber with an inner and an outer wall for maintaining a predetermined water level therein, means for refigerating one of said walls producing a layer of ice, rotary flaking means for progressively breaking flakes from the layer of ice around the wall and chute-type discharge means for ice from the annular chamber, the improvement of switch means located in said discharge chute for actuation upon a predetermined pressure of accumulated ice flakes in said chute, said switch means arranged to shut off the flake ice maker on being activated.

4,048,816

NEEDLE SELECTION MECHANISM

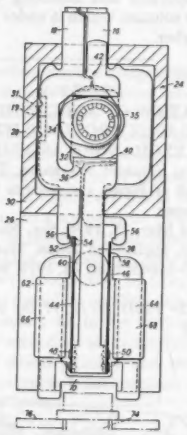
Michael Scarffe, Bletchley, England, assignor to Camber International (England) Limited, England

Filed Aug. 12, 1976, Ser. No. 713,987

Claims priority, application United Kingdom, Aug. 21, 1975, 34704/75

Int. Cl.² D04B *15/78*

U.S. Cl. 66—50 R **8 Claims**



1. A needle selector mechanism for a knitting machine having a main drive therefor comprising:

a cam assembly arranged to be driven in synchronism with said main drive, the cam assembly including two cams or cam lobes and a single cam follower which is arranged to be always in contact with both cams and is mounted for rectilinear movement controlled by the cams;

two jack selector slides each operatively engageable with a knitting needle of said knitting machine to move said needle into one of a plurality of working positions;

two control members, each of said control members being

associated with an individual jack selector slide and comprising a leaf spring one end of which is fixedly mounted to the cam follower;

a latch on each control member adjacent the other end of the leaf spring for releasable latching with a latching surface on the associated jack selector slide; and

electro-magnetic control means selectively operable upon each control member to cause said member to releasably latch with its associated jack selector slide in accordance with a predetermined knitting pattern.

4,048,817

KNITTING MACHINE CAM

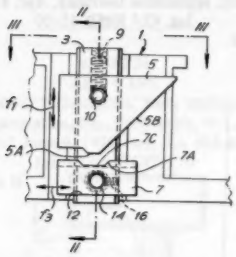
Massimo Bianchi, Florence, Italy, assignor to Macchine Tessili Circolari MATEC S.p.A., Rome, Italy

Filed Sept. 30, 1976, Ser. No. 728,024

Claims priority, application Italy, Oct. 6, 1975, 9575/75

Int. Cl.[2] D04B *15/32*

U.S. Cl. 66—57 **2 Claims**



1. In a knitting machine, a lowering cam engageable with butts of needles to lower the needles along a predetermined lowering path, a stop cam engageable with the butts of the needles to effect progressive deceleration of the needles, said stop cam having means defining a first profile parallel with said lowering path, means defining a second profile corresponding to the maximum lowered position of the needles, and means defining a concave connecting profile between the first and second profiles, means for adjusting the position of one of said cams relative to the other of said cams in the direction of reciprocating movement of the needles, and means for adjusting the position of the other of said cams relative to the said one of said cams in a direction transverse to the first direction so as to ensure that the butt engages the stop cam tangentially to the connecting profile, slide means carrying said cams, and being movable to adjust the loop length of the stitches, said slide means comprising means defining two mutually transverse guides each mounting a respective one of the cams, screw-clamping means for locking each of the cams in a selected position along its associated guide, and respective stop screw means associated with each of the guides and defining said selected position of the cam, the axis of each screw means lying longitudinally of its associated guide.

4,048,818

THERAPEUTIC STOCKING AND METHOD

Glenn F. Cueman, Charlotte, N.C., assignor to Zimmer U.S.A., Inc., Warsaw, Ind.

Filed May 27, 1976, Ser. No. 690,553

Int. Cl.[2] D04B *9/52, 9/54, 9/56*

U.S. Cl. 66—172 E **4 Claims**

1. A circular knit therapeutic stocking having foot, leg and welt portions, said foot, leg and welt portions having alternate wales with stitches of non-elastomeric yarn and intermediate wales in which alternate stitches of non-elastomeric yarn connect with intermediate stitches of bare elastomeric yarn in each said intermediate wale, said bare elastomeric yarn stitches being substantially dominated by said non-elastomeric yarn stitches whereby said bare elastomeric yarn stitches are protected by said non-elastomeric yarn stitches from direct contact with the leg of a wearer while providing graduated compressive force on the leg of a wearer, said foot portion having a closed toe portion, said welt portion of said stocking having an upper terminal portion and a longitudinal slit provid-

ing opposed edges, a flexible relatively non-stretchable downwardly-converging panel secured to said slit opposed edges in the welt portion, said panel extending at the upper terminal portion for less than 180° and converging downwardly, said panel engaging the inside of the upper thigh of the leg of a wearer.

4,048,819

KNITTED GARMENTS

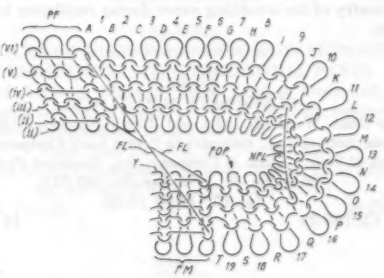
Martin Robert Johnson, Broughton Astley, England, assignor to Ridley, Spriggs and Johnson Limited, England

Filed Apr. 16, 1975, Ser. No. 568,440

Claims priority, application United Kingdom, Apr. 25, 1974, 18039/74; July 12, 1974, 30976/74

Int. Cl.[2] A41B *9/02, 9/04, 9/10*

U.S. Cl. 66—177 **9 Claims**



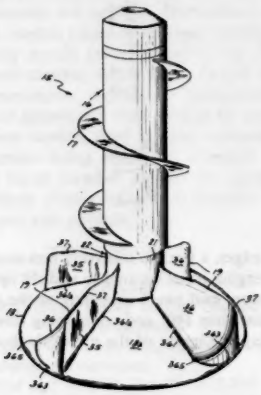
1. A knitted garment having a walewise extending free edge portion comprising a plurality of courses of loops knitted of relaxable yarn and disposed in a predetermined number of uniformly spaced wales, the outer free margin of said portion and also an inner margin which follows the latter and is contiguous with the body of the garment being each miss knitted at at least one wale in each of spaced ones of the courses, and the relaxable yarn being floated inwardly and coursewise across successions of wales located between said two margins in each of the same spaced courses, the defined knit structure being such that the coursewise extending floats, in a relaxed condition and contracted into the body of the fabric, anchor to the latter a flat fold produced, consequent upon contraction of said floats, by the turning over and down of the marginal edge fabric about a predetermined one of the aforementioned wales located between said two margins, the thus folded over edge portion extending at right angles to and across the courses.

4,048,820

RAMPED SCRUBBING VANES FOR AUGER AGITATOR

John William Pielemeier, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 4, 1975, Ser. No. 628,585
Int. Cl.[2] D06F *13/06*
U.S. Cl. 68—133 15 Claims



6. An agitator assembly for a vertical axis washing machine having an auger portion to be driven in unidirectional rotation and a skirt portion to be oscillated about the axis of rotation of the auger, the skirt portion including asymmetric, ramped scrubbing vanes affixed thereto and each comprising:

a vertical face opposed to the direction of rotation of the auger portion; and

a ramped surface facing in the direction of rotation of the auger portion,

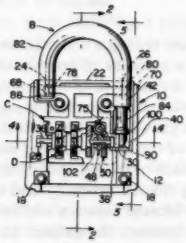
whereby rotational movement imparted to the basket contents in a machine by the auger portion may be substantially counteracted by an opposite rotation induced in wash liquid by the asymmetry of the scrubbing vanes during oscillation in a machine.

4,048,821

COMBINATION PADLOCK

Lazlo Bako, Woodcliff Lake, and Rudolf Wingert, High Crest Lake, both of N.J., assignors to Presto Lock Company, Division of Walter Kidde & Company, Inc., Elmwood Park, N.J.

Filed Jan. 30, 1976, Ser. No. 653,722
Int. Cl.[2] E05B *37/06*
U.S. Cl. 70—25 18 Claims



1. A combination padlock comprising:

a. a body having an internal cavity;

b. a plurality of rotatable permutation tumblers;

c. a shiftable member in the cavity for changing the combination of the tumblers;

d. a shackle having a long leg extending into the cavity and rotatable on the body about the axis of the leg, the leg being shiftable in the body along its axis between retracted and extended position;

e. a bolt cooperable with the tumblers for preventing the leg, when it is retracted in a first angular position, from being shifted to its extended position except when the tumblers are set on open combination;

f. means enabling the combination to be scrambled when the leg is in its extended position;

g. means provided by the shackle for shifting the shiftable member; and

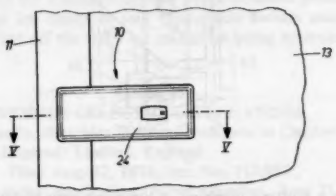
h. means for preventing shifting of the shiftable member except when the tumblers are set in the open combination.

4,048,822

LOCKS FOR DOORS AND THE LIKE

Adalbert Luling, Meinerzhagen, Germany, assignor to Firma F. W. Luling KG, Volmarstein, Germany

Filed Apr. 17, 1973, Ser. No. 352,056
Claims priority, application Germany, Apr. 17, 1972, 2218574
Int. Cl.[2] E05B *65/00*
U.S. Cl. 70—93 24 Claims



1. A lock for a door having a door leaf swingable toward one side from an adjoining door post, comprising:

a keeper provided with pivot means and adapted to be secured to said door leaf at said one side;

a detent fastenable to said door post at said one side; and

a link provided at one end with gripper means for engaging said detent and with key-operable unlocking means for disengaging said gripper means from said detent, said link having a track permanently engaged by said pivot means and extending from said one end to the opposite end of said link for slidably articulating said link to said keeper and, with said detent engaged by said gripper means, allowing limited displacement of the door leaf away from the door post to an extent determined by the length of said track, said unlocking means being accessible through a gap existing between the door leaf and the door post upon such limited displacement.

4,048,823

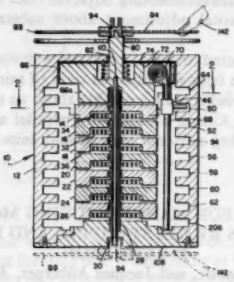
COMBINATION LOCK

Janos Szova, 3615 Greystone Ave., Bronx, N.Y. 10463

Filed Apr. 2, 1976, Ser. No. 673,100
Int. Cl.[2] E05B *37/02*
U.S. Cl. 70—306 10 Claims

1. A combination lock comprising a lock housing, dial means rotatably mounted on said lock housing, a plurality of ratchet wheels rotatably mounted in an aligned stack within said housing, for individual movement between a normal lock-closed position and a lock-open position, pawl means movably mounted in said lock housing, means providing a driving connection between said pawl means and said dial means for movement of said pawl means in a circular path in response to turning movement of said dial means, and guide means disposed within said lock housing for guiding said pawl means into successive engagement with each of said ratchet wheels

responsive to operation of said dial means, said guide means comprising a plurality of tracks formed in said lock housing,



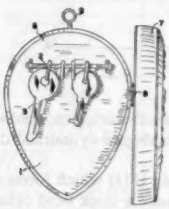
each of said tracks being in alignment with a respective ratchet wheel.

4,048,824

KEY CASE

Macy B. Blackmon, Indianapolis, Ind., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 9, 1976, Ser. No. 694,085
Int. Cl.[2] A47G *29/10*
U.S. Cl. 70—456 R **1 Claim**



1. A neckcase, comprising

an ornamental openable housing large enough in dimensions to house a key, said housing comprising a pair of equal generally heart-shaped halves hingedly affixed to each other;

key fastening means in the housing for removably mounting a house key in the housing; and

housing fastening means for removably supporting said housing on a person, said housing fastening means comprising an eyelet affixed to one of the halves of the housing and a neck chain passing through the eyelet for suspending the housing from the neck of a person.

4,048,825

COIL RE-BAR STRAIGHTENER AND CUTTER

John Burke Dastrup, 5556 Thunderbird Lane, La Jolla, Calif. 92037, and Paul Oscar Green, 5908 Camber Drive, San Diego, Calif. 92117

Filed Dec. 29, 1975, Ser. No. 644,554
Int. Cl.[2] B21D *3/04*
U.S. Cl. 72—12 **27 Claims**

1. A machine having a coil unwinding station for a receiving and unwinding metal rod from the outer periphery of coils of metal rod, and rod driving and straightening stations remote from said coil unwinding station for straightening the unwound metal rod, and a rod cutting station for cutting of the rod to predetermined lengths and including, at said rod driving and straightening stations, the following rod slack detection means:

a rod follower pivotally mounted on said machine at the rod inlet to said driving and straightening stations;

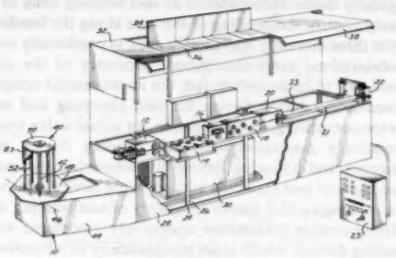
resilient means biasing said rod follower against said rod entering said driving and straightening stations;

and cam means driven by said rod follower and responsive to the incident angle of entrance of said rod processed from said unwinding station to said driving and straightening stations; and

further including, at said coil unwinding station, the following:

spindle means for receiving the coil of metal rod;

support means for said spindle to permit said spindle free rotation thereon;



drive means for rotation of the spindle including prime mover means and brake means operatively connected to said spindle;

and

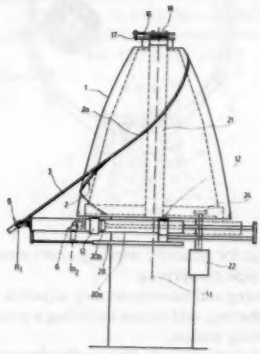
spindle rotation control means including a drive control circuit operatively connected to said prime mover means with switch means in circuit therewith and responsive to the movement of said cam means whereby said prime mover means is disengaged in response to excess slack in said unwound metal rod and is engaged in response to excess tension of said unwound metal rod, independently of the amount of unwound rod on said coil.

4,048,826

DEVICE FOR MANUFACTURING ROTATIONALLY SYMMETRICAL CONSTRUCTIONAL PARTS

Manfred Lechner, Munich; Volker Schirm, Brunnthal, and Heinrich Dettmann, Ingelfingen, all of Germany, assignors to Messerschmitt-Bolkow-Blohm, Germany

Filed Mar. 26, 1976, Ser. No. 670,821
Claims priority, application Germany, Apr. 3, 1975, 2514502
Int. Cl.[2] B21F *3/04, 3/10*; B21D *11/06*
U.S. Cl. 72—21 **10 Claims**



1. In a apparatus for manufacturing a rotationally symmetrical constructional part, with a three-dimensional geometry,

having walls formed of elongated tubes wound spirally about the axis of symmetry of the constructional part and connected to each other, with such manufacturing apparatus comprising a rotatable bending device having a central longitudinal axis of symmetry and at least one bending flank conforming to the predetermined three-dimensional geometry of the constructional part to be manufactured, holding means operable to clamp one end of each tube to the bending device for bending the tube to shape by bending it into contact with the bending flank, and a clamping and adjusting device operatively associated with the bending device and operable to clamp the other end of each tube, said clamping and adjusting device being radially displaceable relative to said axis of symmetry and angularly displaceable relative to said bending flank to continuously control the bending of the tube along the bending flank about three mutually intersecting axes, in conformity with such predetermined three-dimensional geometry of the constructional part to be manufactured; the improvement comprising a closed-loop control system for said clamping and adjusting device comprising, in combination, an actual-value transmitter operatively associated with said bending device and said clamping and adjusting device for measuring the radial displacement of said clamping and adjusting device relative to the central longitudinal axis of symmetry of said bending device; a reference-value transmitter operatively associated with said bending device, which is set automatically as a function of the angular displacement between said bending device and said clamping and adjusting device; means deriving an error signal value represented by the difference between the output values of said actual-value transmitter and said reference-value transmitter; and an actuator connected to said clamping and adjustment device and operable to radially displace said clamping and adjusting device as a function of the error signal value.

4,048,827

APPARATUS FOR FORMING A LARGE DIAMETER PIPE

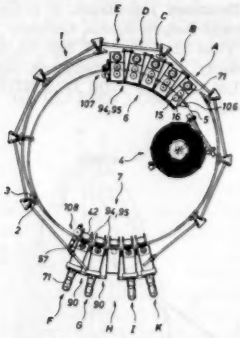
Xaver Lipp, Hohenstaufenstrasse 30, D 7090 Ellwangen, Jagst, Germany

Filed June 28, 1976, Ser. No. 700,733

Claims priority, application Germany, July 4, 1975, 2529925; Dec. 23, 1975, 2558454

Int. Cl.² B21C *37/12*

U.S. Cl. 72—50 **11 Claims**



1. An apparatus for helically winding sheet metal to form a larger diameter pipe comprising

means for forming and interconnecting adjacent edges of the sheet by rabbeting, said means including a profiling station and a rabbeting station,

each of said stations including a plurality of processing units and each of said units having pairs of processing rolls for forming said edges, said pairs of rolls being disposed along an arcuate path,

said units in each station being serially arranged to sequentially form said edges;

drive means for driving said rolls;

hinge means interconnecting adjacent ones of said units for relative pivotal adjustment about substantially parallel axes; and

means connected to said units for adjusting the angular relationship between adjacent ones of said units comprising a threaded spindle rotatable about an axis perpendicular relative to said substantially parallel axes and threadedly engaging adjacent ones of said units.

4,048,828

PROCESS FOR MANUFACTURING MONOBLOC WHEELS BY DIE STAMPING AND ROTARY EXTRUSION

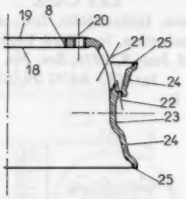
Roger Lucas, Issoire, and Jacques Auberger, Jumeaux, both of France, assignors to Forgeal, Societe pour le Forgeage et l'Estampage des Alliages Legers, Paris, France

Filed Mar. 9, 1976, Ser. No. 665,264

Claims priority, application France, Apr. 9, 1975, 75.11726; Dec. 3, 1975, 75.37697

Int. Cl.² B21D *22/14*; B21H *1/02*

U.S. Cl. 72—83 **10 Claims**



1. A process for manufacturing monobloc metal wheels for vehicles from a rough shaped cylindrical disc comprising the following steps:

a. a first die stamping (M1) which forms the wheel disc and on its circumference a thick bead oriented in a direction parallel to the wheel axis and the inner side of the wheel;

b. a second die stamping (M2) which produces an elongation of said bead in the same direction as in said first die stamping and forms in a rough shape a small flange of the rim;

c. a third die stamping (M3) which forms an additional elongation of said bead in the same direction as in the first and second die stamping and further forms said small flange of the rim in almost its final shape;

d. cylindrical rotary extrusion of the disc to provide additional elongation in the same direction parallel to the axis and the inner side of said wheel;

e. widening out in a press of the part elongated in step (d) which roughly shapes a large flange of the rim; and

f. conical rotary extrusion to complete the shaping of said large flange.

4,048,829

GASKET WINDING MACHINE

Hector Thomas, 59 Melvill St., Southdale, Johannesburg, Transvaal, South Africa

Filed July 29, 1974, Ser. No. 492,818

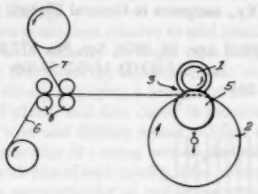
Claims priority, application South Africa, July 6, 1973, 73/4584; July 12, 1973, 73/4732

Int. Cl.² B21C *47/04*

U.S. Cl. 72—148 **12 Claims**

1. Apparatus suitable for manufacturing spirally wound gaskets, comprising at least two co-planar forming discs having differing diameters, defining between them a nip adapted to receive gasket-forming material so as to wind the material around the smaller diameter disc, and at least one guide member for the material located on each side of the larger diameter

disc, and mounted on an axis displaced from the axes of said forming discs, the arrangement being one wherein at least one forming disc is radially movable relative to the other forming



disc and movable with respect to said guide member, and the radially movable forming disc is flanked by at least a portion of the guide member and movable in the space between the guide members.

4,048,830

FOUR-ROLLER SHEET BENDING MACHINES

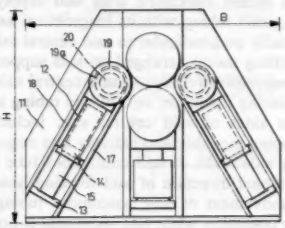
Fritz Elsener, Nenzlingen, Switzerland, assignor to Chr. Hausler AG, Switzerland

Filed Dec. 23, 1976, Ser. No. 753,594

Claims priority, application Switzerland, Jan. 29, 1976, 1103/76

Int. Cl.[2] B21D *5/14*

U.S. Cl. 72—175 **3 Claims**



1. A four-roller sheet bending machine comprising, in combination:

a frame;

a pair of nip rollers;

two side-rollers disposed on respectively opposite sides of said nip rollers;

four pressure-fluid operable devices each displaceably supporting a respective end portion of one of said side-rollers, each said device comprisng a cylinder and a piston provided with a rod extending through one end portion of said cylinder to bear against said frame, the respective other end portion of each said cylinder defining a housing;

bearing means for the respective side-roller end portion provided in each housing; and

respective guide means on said frame displaceably mounting each said cylinder.

4,048,831

TWO-ROLLER DRIVING DEVICE

Wolfgang Fabian, Dortmund, Hombruch; Konrad Klein, Dortmund, Wambel, and Theodor Sevenich, Dortmund, all of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Germany

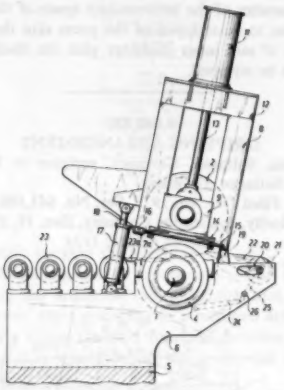
Continuation of Ser. No. 603,945, Aug. 12, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,706

Claims priority, application Germany, Aug. 13, 1974, 2438759

Int. Cl.[2] B21B *39/12*

U.S. Cl. 72—251 **8 Claims**

1. For use in connection with an underground reel in a rolling mill for band-shaped rolling stock, a two-roll driving device which includes in combination: frame means, a first driving roll rotatably journalled in said frame means, a stand independently pivotable about the axis of rotation of said first roll, a second roll supported by said stand for rolling cooperation with said first roll, adjusting means supported by said stand and operatively connected to said second roll for selectively adjusting said second roll relative to said first roll, and power operable pivoting means operatively connected to said stand independently to pivot the latter and thereby said second roll from a first position in which said second roll and said first roll have their axes of rotation located in an at least approxi-



mately common vertical plane to a second position in which their axes of rotation are located in an at least approximately common inclined plane forming an acute angle with said approximately common vertical plane while that part of said inclined plane which extends through said second roll is located behind said common vertical plane when viewing said driving device in the direction in which said first and second rolls are intended to pass the rolling stock to be rolled therethrough, said second roll also being pivotable by said power operable pivoting means from said second position to said first position.

4,048,832

SEPARATING DEVICE FOR REMOVING THE PRESS SKIN FROM A COMBINED EXTRUSION DISC

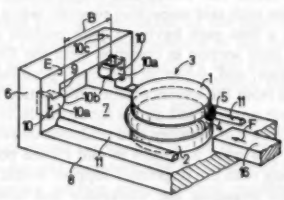
Richard Raab; Kurt Spindler, both of Rothenbach; Herbert Brand, Henfenfeld, and Leonard Gast, Nurnberg, all of Germany, assignors to DIEHL, Nurnberg, Germany

Filed Feb. 3, 1976, Ser. No. 654,755

Claims priority, application Germany, Feb. 15, 1975, 2506447

Int. Cl.[2] B21C *23/00*

U.S. Cl. 72—255 **7 Claims**



1. A separating device for separating the ring-shaped press skin from a composite extrusion disc comprising a press disc and a stripper disc superimposed but spaced from each other by an annular intermediate space for receiving the press skin,

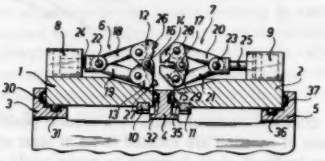
especially for copper containing alloys and difficult to press metals and alloys, which includes in combination; a separating head having a passage therethrough, a slideway leading into said passage for receiving and slidingly supporting a composite extrusion disc from which the press skin is to be removed, and two blocks connected to said separating head and located opposite to each other while projecting into said passage so as to be able to engage the annular intermediate space between a press disc and a stripper disc of a composite extrusion disc to be freed from a press skin at said intermediate space when such composite extrusion disc enters said passage, the distance between said blocks being within the range of from the length of the inner diameter of the intermediate space of the composite extrusion disc to be stripped of the press skin thereon to the total length of said inner diameter plus the thickness of the press skin to be stripped.

4,048,833

GRIPPING ARRANGEMENT

Horst Lorenz, Solingen, Germany, assignor to Kieserling & Albrecht, Solingen, Germany

Filed Dec. 16, 1975, Ser. No. 641,188
Claims priority, application Germany, Dec. 19, 1974, 2460168
Int. Cl.² B21C *1/14*
U.S. Cl. 72—290 **10 Claims**



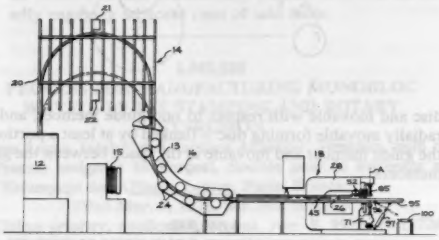
7. In a machine for treating elongated workpieces, such as a drawing bench, stripping machine and the like, a combination comprising a die having an opening for passage of a workpiece therethrough; and means for continuously advancing the workpiece in an advancement path through said opening of said die, including elongated guide means parallel to a section of the advancement path downstream of said die, a pair of supports each mounted on said guide means for reciprocatory movement along the same in a reciprocatory path that is parallel to, offset from, and coextensive with, the advancement path section and the reciprocatory path of the other support; means for reciprocating each of said supports in the reciprocatory path thereof in an advancement and a return direction, respectively, past the other support; at least a pair of jaws for each respective support; means for mounting each respective jaw pair on the respective support for displacement relative thereto only in a pivoting movement between a closed and an open position in which said respective jaw pair engages, and is disengaged from, the workpiece, respectively, and for joint reciprocation with said respective support, when in said closed position, in a first path having a path portion about the advancement path section in common with the first path of the other jaw pair, and, when in said open position, in a second path spaced from the advancement path section and from said common path portion; and means for so displacing said jaws of each respective pair between said positions thereof that at least one of said jaw pairs is always in said closed position thereof while moving with the respective support in said advancement direction for engaging the workpiece and continuously advancing the same through said opening of said die, while each of said jaw pairs is in said open position thereof at least while moving with the respective support in said return direction past the other jaw pair for avoiding interference with the movement of the latter by moving in said second path that is outside said common path portion.

4,048,834

APPARATUS FOR FORMING SERPENTINE HEAT EXCHANGERS

Charles R. Durbin, and Bernard W. Schoenbachler, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Apr. 15, 1976, Ser. No. 677,505
Int. Cl.² B21D *11/07, 53/06*
U.S. Cl. 72—294 **3 Claims**



1. An apparatus for forming a serpentine heat exchanger having a predetermined length from a continuous tubing including a forming and bending head means for successively bending increments of said continuous tubing in alternate directions about a central axis comprising:

a. tube supply means for receiving said continuous tubing;

b. support means associated with said supply means for receiving said tubing with its longitudinal axis in a plane substantially perpendicular to said central axis;

c. tube shifting means arranged on said support means for lateral movement relative to said central axis for successively placing the increments of said tubing to be bent on alternate sides of said central axis, including holding means being movable alternatively into engagement with opposite side walls of said continuous tube diametric to the rotational direction of said forming head to prevent lateral movement of said continuous tubing during the bending operation while said increment is positioned substantially parallel with said continuous tube;

d. tube feed means arranged on said support means for advancing said tubing along its longitudinal axis in predetermined increments relative to said head so that a selected portion of said increment to be bent in said plane is arranged in cooperative relationship with said head means, including an advancing member slidably mounted on a guide member for longitudinal movement in a path parallel to said plane, tube holding means mounted on said advancing member being movable into engagement with said tubing when said feed means is in its retracted position relative to said central axis, stop means adjustably arranged longitudinally on one of said members positioned to cooperatively engage damping members on the other of said members when said feed means is in said retracted position to regulate the length of said increment advanced longitudinally relative to said central axis by said advancing member;

e. said head means including a pair of shaping elements diametrically arranged on said central axis on either side of said plane being dimensioned to deform said selected portion into an oval cross section having its major axis lying parallel with said plane;

f. drive means associated with said head means being operable when said selected portion is in the advanced position between said shaping elements for moving said head means longitudinally along said central axis to move said shaping elements into engagement with said selected portion of said tube with sufficient pressure to deform said portion into said oval cross section; and means for imparting a successive rotational oscillation to said head means

in one direction while the shaping elements are in engagement with said selected portion to bend said increment in said selected portion substantially 180° about said central axis so that said increment is substantially parallel to said continuous tubing;

g. cutoff means positioned relative to said continuous tubing being movable radially through said longitudinal axis including a first cutter on one side of said plane arranged for cooperatively engaging a second cutter on the other side of said plane, said first cutter is mounted for lateral movement with said shifting means and said second cutter includes a plurality of cutting area so that said first cutter is aligned with one of said cutting areas, means for moving said cutters perpendicular to said plane and through said tubing to sever said heat exchanger from said continuous tube after a predetermined number of successive bending operations.

4,048,835

METHOD OF PUNCHING A SMALL HOLE IN A PRECISION MECHANICS WORKPIECE

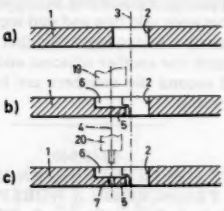
Urs Giger, Solothurn, Switzerland, assignor to Eta A.G. Ebauches-Fabrik, Switzerland

Filed Aug. 27, 1976, Ser. No. 718,213

Claims priority, application Switzerland, Sept. 16, 1975, 11958/75

Int. Cl.² B21D *53/10*

U.S. Cl. 72—334 **4 Claims**



1. In a method of punching a small hole in a precision mechanics workpiece such as a component of a timepiece movement, which includes exerting pressure upon a predetermined region of a workpiece in such a way that a portion of the material of which said workpiece is made yields and is displaced so that the thickness of said region becomes less than the thickness of the remainder of said workpiece, the improvement comprising the steps of:

exerting said pressure in such a way that said material is displaced in the direction of said pressure and yields at right angles to said pressure to form a region of reduced thickness, and

punching said hole of a diameter from about 0.1 to 0.3 mm in said region at a location such that the distance between the edge of said hole and the edge of said region is greater than the diameter of said hole and the area of said region is at least five times as great as the cross-sectional area of the hole.

4,048,836

FORMING AND HEAT TREATING PROCESS

Robert A. Eddy; Norman F. Gustafson, both of Westboro, and Stephen J. Erwin, North Grafton, all of Mass., assignors to Wyman-Gordon Company, Worcester, Mass.

Continuation of Ser. No. 293,092, Sept. 28, 1972, abandoned, which is a continuation of Ser. No. 41,947, June 1, 1970, abandoned. This application Aug. 26, 1976, Ser. No. 718,050

Int. Cl.² B21J *1/06*

U.S. Cl. 72—364 **3 Claims**

1. A process for forming and heat treating an aluminum alloy article, comprising the steps of:

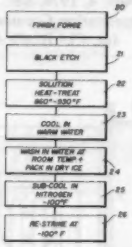
a. forging the article in a set of finish dies,

b. black etching the article,

c. solution heat treating the article at a temperature in the range from 830° F. to 930° F.,

d. immediately cooling the article in warm water at a temperature in the range from 140° F. to 180° F., and removing it as soon as it reaches water temperature,

e. immediately cooling the article in water at room temperature,


FINISH FORGE
BLACK ETCH
SOLUTION HEAT-TREAT 850°-930°F
COOL IN WARM WATER
WASH IN WATER AT ROOM TEMP + PACK IN DRY ICE
SUB-COOL IN NITROGEN -100°F
RE-STRIKE AT -100° F

f. immediately packing the article in dry ice,

g. sub-cooling the article in nitrogen to −100° F., and

h. restriking the article in the said finish dies, the article being stored after restriking in a nitrogen atmosphere at −100° F., being checked for configuration, and being reworked if necessary before being allowed to return to room temperature.

4,048,837

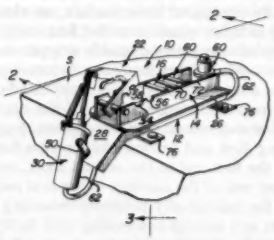
CHOKER STRAIGHTENER

Clark V. Spencer, 817 NW. A St., and Benjamin G. Rondeau, 1170 NE. 10th, both of Grants Pass, Oreg. 97526

Filed Aug. 9, 1976, Ser. No. 713,050

Int. Cl.² B21D *7/06*

U.S. Cl. 72—387 **9 Claims**



1. A choker straightener, comprising, in combination:

a. a base member;

b. two laterally spaced cable support members arranged on the base member for supporting a bent portion of cable between the support members;

c. lever means pivotally mounted on the base member for movement toward and intermediate of the cable support members and selectively engaging a bent portion of cable intermediate the associated cable support members and straightening the bent portion; and

d. power means mounted on the base member and connected to the lever means for moving the lever means relative to the cable support members, the base member including a first mounting surface and a second mounting surface disposed at an obtuse angle with respect to the first mounting surface, the cable support members being mounted on the first mounting surface and the power means including a linear fluid motor mounted on the second support surface, with the lever means extending longitudinally and mounted on the first mounting surface adjacent to and

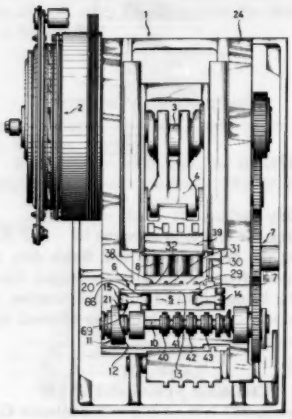
extending longitudinally away from the second mounting surface and connected to the fluid motor.

4,048,838

ARRANGEMENT FOR CONTROLLABLY RECIPROCATING A WORKPIECE GRIPPING ASSEMBLY OF A MULTI-STAGE PRESS

Ernst Faymonville, Dusseldorf-Wersten, Germany, assignor to Malmedie & Co. Maschinenfabrik, Dusseldorf, Germany

Filed Nov. 4, 1976, Ser. No. 738,869
Claims priority, application Germany, Nov. 4, 1975, 2549319
Int. Cl.² B21D *43/5*
U.S. Cl. 72—405 **3 Claims**



1. In a multi-stage press, a plurality of aligned, workpiece-holding first stations spaced along a first direction and supported in the frame, a first shaft rotatably supported in the frame, a first control disc secured to the first shaft and having an axially contoured front surface, an elongated carriage extending in a first plane over the first stations for supporting a plurality of selectively operable gripper means to engage and transport workpieces between successive ones of the first stations, a second shaft, a roller supported on the second shaft, means for connecting one end of the carriage to the second shaft, first and second elongated connecting rods having corresponding first and second ends, means for coupling the first end of the first rod to the second shaft, means for connecting the other end of the carriage to the first end of the second rod, means for individually pivotally mounting the second ends of the first and second connecting rods to the frame, means for urging the roller into steady contact with the contoured front surface of the control disc whereby the rotation of the first shaft about its axis will cause a positive movement of the carriage along a reciprocatory path in the first plane corresponding to each point of movement of the control disc about its axis with a minimum of play, and means for rotating the first shaft about its axis.

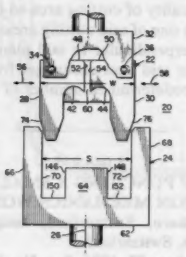
4,048,839

DIE MEANS HAVING WORKPIECE RELEASING MEANS

Joseph Peterpaul, West Orange, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Oct. 14, 1976, Ser. No. 732,325
Int. Cl.² B21D *37/12*
U.S. Cl. 72—412 **12 Claims**

1. A die set for selectively deforming a ferrule or similar article comprising: a first die member and a second die member; said first and said second die members being arranged for movement towards and away from one another along a central axis; said first die member having a first discrete die element, a second discrete die element, a support means, a first pin member loosely coupling said first die element to said support means, and a second pin member loosely coupling said second die element to said support means, said first and said second die elements being arranged in juxtaposed relationship on opposite sides of said central axis and moveable towards and away from said central axis along a common plane, said first and said second pin members each extending through a respective enlarged transverse opening in a respective one of said first and said second die elements and engaging said support means, the



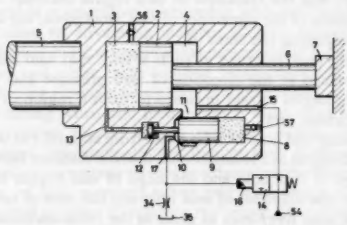
diameter of said transverse openings being sufficiently greater than the diameter of said pin members so as to permit each of said first and said second die elements to freely float thereabout; said second die member having a central anvil portion flanked by opposing leg portions selectively spaced apart to receive therebetween said first and said second die elements of said first die member and to move said first and said second die elements towards one another adjacent said central axis as said first and said second die members are brought together in mating relationship.

4,048,840

APPARATUS FOR PRODUCING AN INSTANTANEOUS PRESSURE ON A WORKPIECE

Korst Knabel, Uedesheimer Strasse 5, 4000 Dusseldorf, Germany

Filed Dec. 22, 1976, Ser. No. 753,483
Claims priority, application Germany, Jan. 13, 1976, 2600948
Int. Cl.² B21J *9/12*
U.S. Cl. 72—437 **20 Claims**



1. Apparatus for producing an instantaneous pressure on a workpiece, comprising a main cylinder having a pair of opposite ends; a working piston axially movable in said main cylinder between a working stroke and a return stroke and dividing the main cylinder into two compartments; a piston rod projecting through one of the compartments and one of the ends of the main cylinder to the outside of the latter and engaging with the free end thereof a workpiece; a gas under pressure in the other compartment and acting on one side of the working piston tending thereby to move said working piston along its working stroke; means including a control valve for feeding a pressure fluid into said one compartment to act on the other side of said working piston; means forming an enclosed space

communicating with said one compartment so as to be filled with said pressure fluid; a control piston movable from a first position extending into said space to a second position withdrawn out of said space, one end face of the control piston being, in said first position, free of pressure, and pressure means acting on the other face of the control piston for biasing the same to said first position, said control piston having a volume to produce during its movement to said second position an instantaneous relief of the pressure of the pressure fluid acting on the other side of said working piston so that the gas pressure acting on the one side of the working piston will produce a corresponding instantaneous pressure by the piston rod on the workpiece; and means for moving said control piston from said first to said second position thereof.

4,048,841

FORMING APPARATUS

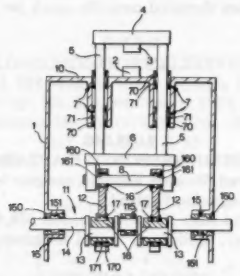
Anthony John Kent, Arbroath, Scotland, assignor to Matrix Engineering Limited, Scotland

Filed Apr. 30, 1975, Ser. No. 573,301

Claims priority, application United Kingdom, May 1, 1974, 19168/74

Int. Cl.² B21J *9/18*

U.S. Cl. 72—450 **7 Claims**



1. Forming apparatus comprising a support structure; a bed fixedly carried by said support structure for carrying a first part of form tooling; crosshead means consisting of two crosshead portions rigidly connected with one another, one of said crosshead portions being adapted to carry a second complementary part of form tooling for co-operation with said first part thereof; shaft means mounted on the second of said crosshead portions; linear motion hydrostatic bearing means mounting said crosshead means for guided reciprocation thereof relative to the support structure and for accurate registration of the co-operating form tooling parts; a single crankshaft rotatably mounted in the support structure and having a pair of spaced apart axially aligned eccentric crank pins; a pair of laterally spaced apart connecting rods each rotatably mounted about a corresponding crank pin of the crankshaft by respective rotary hydrostatic bearing means, the other ends of the connecting rods being pivotally connected by respective further rotary hydrostatic bearing means to the shaft means of said second of said crosshead portions, whereby synchronized reciprocation of the connecting rods is obtainable in imparting reciprocation to the crosshead means, the spacing apart of the crank pins and of the connecting rods being sufficient to impart reciprocation to the crosshead means in a balanced manner.

4,048,842

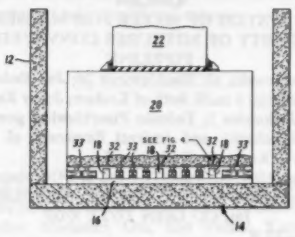
SHOCK AND VIBRATION CONTROL SYSTEM FOR FORGING HAMMER

Paul Baratoff, Jackson Heights, N.Y., assignor to Korfund Dynamics Corporation, Westbury, N.Y.

Filed Oct. 21, 1976, Ser. No. 734,586

Int. Cl.² B21J *13/04*

U.S. Cl. 72—455 **8 Claims**



1. A shock and vibration control system for a forging hammer comprising an inertia block having the forging hammer mounted thereon, a foundation including isolator-supporting portions located under the inertia block and having horizontal upper surfaces located a distance X below the bottom of the inertia block, a multiplicity of shock and vibration isolators supported on said surfaces, at least one of the isolators including friction damper means for damping vertical vibration and vibration in a first horizontal direction of the inertia block and at least one other of the isolators including friction dampers for damping vertical vibration and vibration in a second horizontal direction perpendicular to the first direction of the inertia block, and at least one structural spacer interposed between each of the isolators and the inertia block for load support of the inertia block and forging hammer on the isolators, each spacer having a height S substantially equal to the difference between the distance X and the loaded height H of the isolator and the height S of each spacer being greater than the sum of (1) the difference between the unloaded height of the isolator and the loaded height and (2) the minimum height of a jack adapted to load the isclator in place under the inertia block, the aforesaid dimensions and dimensional relationships between the dimensions X, S and H permitting each isolator to be inserted in unloaded condition under the inertia block and to be loaded by a jack and the spacers then inserted between the loaded isolator and the inertia block.

4,048,843

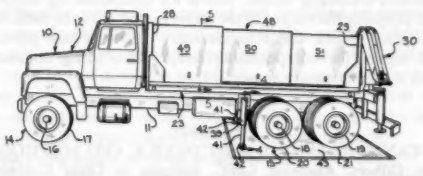
SCALE TESTING VEHICLE

Glenn G. Dunbar, 2608 Overbrook Drive, Toledo, Ohio 43614

Filed July 12, 1976, Ser. No. 704,291

Int. Cl.² G01G *23/00*

U.S. Cl. 73—1 B **9 Claims**



1. A scale testing vehicle for use on platform scales having at least one scale section, said scale testing vehicle including a chassis, said chassis mounting a front axle assembly and a rear axle assembly, a weight bed mounted on said chassis, a plurality of uniform weight units positioned on said bed, crane means mounted adjacent said chassis for lifting said weight units between said bed and ground elevation and lifting cylinder

means mounted adjacent and forward of said rear axle assembly, said lifting cylinder means being movable to an extended position wherein said front axle assembly is elevated and the entire static load of such vehicle and weight units is applied to said lifting cylinder means and said rear axle assembly, such load being applied within the confines of a single one of such scale sections.

4,048,844

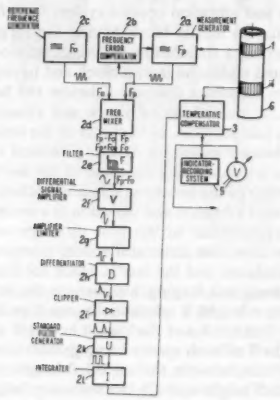
ELECTRIC SYSTEM OF METER FOR MEASUREMENTS OF DENSITY OF MIXTURES CONVEYED IN A PIPELINE

Andrzej Dunikowski, ul. Sienkiewicza 26; Jan Bednarczyk, ul. Chodowieckiego 5 m.39, both of Krakow; Jerzy Keska, powiat Krakow, Jaskowice 1; Tadeusz Pisarkiewicz, powiat Mlawa, Rydzyn Szlachecki, and Andrzej Zamarski, ul. Marchlewskiego 22/2, Krakow, all of Poland

Continuation of Ser. No. 503,911, Sept. 6, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 669,461

Int. Cl.[2] G01N *27/22, 9/00*

U.S. Cl. 73—32 R **2 Claims**



1. An electric system for a meter for the measurement of the content of a mixture being conveyed in a pipeline, said system comprising a capacity sensor installed in said pipeline, a mixer, a compensation system for frequency variations, a capacitance transducer including a measurement generator having a first input connected to the capacity sensor, a second input connected to the compensation system for frequency variations and an output connected to said mixer, a reference frequency generator having an output connected to said mixer, a series circuit connected to the output of said mixer including a low-pass filter, an amplifier, an amplitude limiter, a differentiating system, a pulse clipper, a generator of standard pulses and an integrating system; the series circuit having an output, an indicator-recording means, means for compensating temperature coupling the output of the series circuit with the indicator-recording means, and a temperature sensor in said pipeline, said means for compensating temperature being connected with the temperature sensor.

4,048,845

CANNING JAR LID TEST DEVICE AND METHOD

Ray Gilbert, Anaheim, Calif., assignor to Glass Containers Corporation, Fullerton, Calif.

Filed Oct. 14, 1976, Ser. No. 732,271

Int. Cl.[2] G01M *3/06*

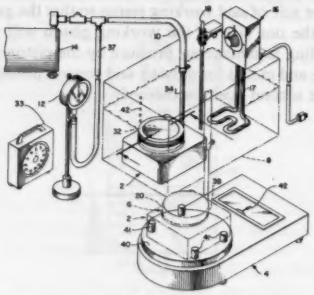
U.S. Cl. 73—45.5 **5 Claims**

1. An apparatus for testing the characteristics of jar closures comprising;

a chamber assembly, said chamber assembly including a base and a mock jar finish integrally attached thereto, said base and said mock jar finish defining a closed chamber upon fastening a jar closure to said finish, said closed chamber including a duct communicating between the interior and exterior of said chamber;

a pressure varying means communicating through said duct into said chamber whereby the pressure in said chamber may be varied;

means for measuring the pressure in said chamber;



a temperature bath adapted to allow immersion of said chamber assembly into said bath, whereby said assembly may be brought to a predetermined temperature;

means for detecting the passage of material through said jar closure upon creation of a sufficient pressure differential between the interior and exterior of said closed chamber; and

means for measuring the torque applied to a threaded jar closure when threaded onto the mock jar finish.

4,048,846

PRESSURE RESPONSIVE APPARATUS

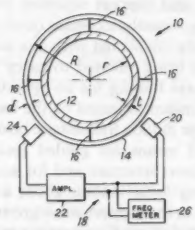
Reginald Catherall, Woking, England, assignor to Bell & Howell Limited, Basingstoke, England

Filed May 20, 1976, Ser. No. 688,428

Claims priority, application United Kingdom, May 30, 1975, 23719/75

Int. Cl.[2] G01N *29/02*

U.S. Cl. 73—67.2 **27 Claims**



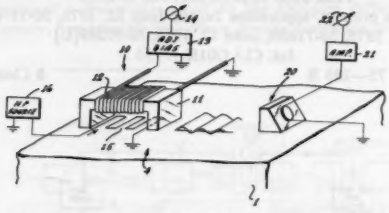
1. Apparatus responsive to the pressure of a fluid contained in or surrounding a stiff but resilient hollow body, comprising a stiff but resilient ring, $2n$ (where n is an integer greater than 1) equi-spaced radially extending struts connected between a periphery of said ring and a peripheral surface of said body to support said ring concentrically with said body, means for exciting natural vibrations of said ring at a resonance frequency and means for providing a signal representative of the frequency of said vibrations.

4,048,847

NONDESTRUCTIVE DETECTION OF STRESS

George A. Alers, and Robert B. Thompson, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed July 14, 1976, Ser. No. 705,213
Int. Cl.[2] G01N 29/00
U.S. Cl. 73—67.5 R 30 Claims



1. A method of measuring stress in a part of a structural material comprising the steps of:

generating magnetically in the material vibrations as a result of alternation of magnetostriction in the material and in a well defined first location of the structural part;

detecting at a different location the vibrations as generated and launched from the first location, thereby producing a signal having a particular amplitude;

deriving from the preceding steps a representation of the efficiency of the generation of the vibrations at said first location; and

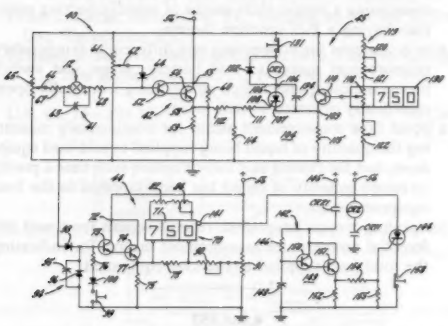
comparing the representation with a representation of a generation of vibrations generated and detected in a similar manner but at a different location of the same part or at a location of a different part of the same material.

4,048,848

LOAD MONITORING SYSTEM

Frank R. Dybel, 981 Wingate Road, Olympia Fields, Ill. 60461

Continuation of Ser. No. 521,466, Nov. 6, 1974, abandoned. This application May 3, 1976, Ser. No. 682,463
Int. Cl.[2] G01B 7/16
U.S. Cl. 73—88.5 R 28 Claims



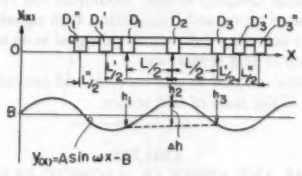
11. A system for sensing stresses and monitoring tonnage loads that are intermittently applied to a deformable member comprising a transducer having a pair of mounting means fixed to said member substantially in line with the stress to be detected, said transducer including a piezoelectric element interposed between said mounting means for generating output electrical signals having voltages substantially proportional to the loads applied to said member, amplifying means coupled to said transducer for amplifying a signal produced by said transducer, a load indicating circuit coupled to said amplifying means, said load indicating circuit including a digital readout meter which has a display of a plurality of numerical digits and is actuated in response to said transducer signals, a peak holding circuit means for maintaining a transducer signal to said amplifying means for a sufficient time to enable said meter to fully digitize the numerical value of successive loads applied to said member in response to said transducer signals, said peak holding circuit means including a capacitor coupled between an input side of said amplifying means and ground, and a diode connected between said transducer and amplifying means and poled to allow conduction of current from said capacitor only in the direction of said amplifying means.

4,048,849

METHOD AND APPARATUS FOR MEASURING SURFACE FLATNESS OF MATERIAL

Makio Gocho; Masanori Ota, and Tatsuo Kuraishi, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed July 3, 1975, Ser. No. 592,817
Claims priority, application Japan, July 22, 1974, 49-83309
Int. Cl.[2] G01B 7/28
U.S. Cl. 73—105 7 Claims



1. In an apparatus for measuring the surface flatness of a metal product with a plurality of detectors arranged opposite to said product to be measured to measure in non-contacting manner the gap between said detectors and the surface of said product, the combination comprising:

a reference plane arranged opposite to the surface of said product;

a first detector means including at least three detectors respectively arranged at each of a first set of at least three detecting points which are arranged at a predetermined substantially equal distance from each other on said reference plane along a direction of measurement, and a second detector means including at least three detectors respectively arranged at each of a second set of at least three detecting points using in common the detector of said first detector means which is located at said central detecting point of said first set of detecting points;

arithmetic means for receiving and operating on measured signal values from only one of said first and second detector means respectively associated with said first and second sets of detecting points;

means for selectively coupling only one of said first and second detector means to said arithmetic means at a time;

recording means coupled to said arithmetic means;

analyzing means coupled to said arithmetic means;

setting means coupled to said analyzing means for presetting the value of a distance L between the detecting points on both sides of the central detecting point in said selected set of three detecting points; and

means coupled to said analyzing means for measuring the distance of relative motion between said product and only said selected set of detecting points which are defined by said selected detector means.

4,048,850

MECHANISM FOR GAUGING THE CATCH WITHIN A TRAWL NET

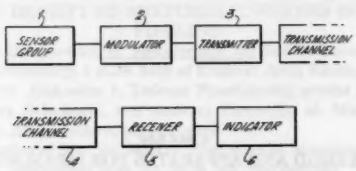
Kjell Øystein Ramberg, and Björn Kirknes, both of Horten, Norway, assignors to Simrad A.S., Norway

Filed Oct. 7, 1976, Ser. No. 730,479

Claims priority, application Norway, Oct. 8, 1975, 753403

Int. Cl.² G01L *5/00*

U.S. Cl. 73—133 R **9 Claims**



1. Apparatus for gauging the catch within a trawl net comprising:

at least one sensor disposed to sense a change in the geometry of the trawl net and providing an output signal indicative of such change;

a modulator receiving the output signals from said sensor and in response thereto generating a modulated signal;

a transmitter coupled to said modulator for receiving the modulated signal and transmitting such signal;

a receiver detecting the transmitted signal as an indication of the state of said sensor; and

an indicator coupled to said receiver and providing an indication of the state of said sensor.

4,048,851

AXIAL AND ANNULAR MAGNETO-ELASTIC DYNAMOMETERS

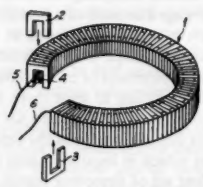
Jean Louis Portier, Paris, France, assignor to Soletanche, France

Continuation of Ser. No. 420,276, Nov. 29, 1973, abandoned. This application Apr. 15, 1975, Ser. No. 568,173

Claims priority, application France, Oct. 9, 1973, 73.35986

Int. Cl.² G01R *33/12*

U.S. Cl. 73—141 A **12 Claims**



1. A stress measuring device, comprising:

a plurality of U-shaped pieces joined together to form a ferro-magnetic core having an uninterrupted annular cylindrical shape, each U-shaped piece having a base portion and a pair of leg portions extending from said base portion, adjacent ones of said U-shaped pieces being located with respect to each other such that the base portion of one U-shaped piece lies adjacent the open end of the next adjacent U-shaped piece said adjacent U-shaped pieces together defining a central annular duct within said core; and

means for detecting a compressive stress axially applied to said ferro-magnetic core, comprising an electric winding located in said annular duct in the form of a ring substantially surrounded by said core such that two ends of said winding comprising electrical leads extend out from said duct through an opening in a wall of said core.

4,048,852

INTEGRATING CALORIMETER

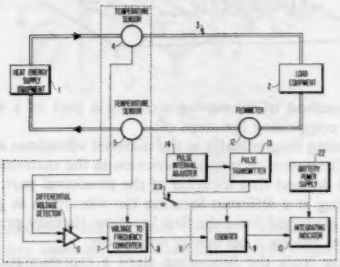
Kaichi Sakakibara, Kyoto, and Hiroyuki Sumida, Kagawa, both of Japan, assignors to Kabushiki Kaisha Takuma and Ryusho Sangyo Kabushiki, both of Osaka, Japan

Filed June 9, 1976, Ser. No. 694,289

Claims priority, application Japan, June 12, 1975, 50-71798; June 12, 1975, 50-71800; June 12, 1975, 50-80369[U]

Int. Cl.² G01K *17/16*

U.S. Cl. 73—193 R **8 Claims**



1. An integrating flow calorimeter means for measuring heat exchanged between a load equipment and a liquid circulating therethrough, which comprises:

an electric battery mounted integral with the integrating flow calorimeter means;

a differential temperature measurement means operable when connected to said battery, said differential temperature measurement means including a liquid supply temperature sensing means for producing a first voltage proportional to the temperature of the liquid being supplied to the load equipment and a liquid exhaust temperature sensing means for producing a second voltage proportional to the temperature of the liquid being exhausted from the load equipment, each of said temperature sensing means comprising a temperature sensor of semiconducting materials having a P-N junction therein;

a switch means for connecting said differential temperature measurement means to said battery, when said switch means is closed, said switch means being a normally open, electrically operated switch means;

a liquid flow measurement means for continuously measuring the quantity of liquid being supplied to said load equipment, and for closing said switch means each time a predetermined quantity of liquid has been supplied to the load equipment; and

integrating means, adapted to receive signals from said differential temperature measurement means, for indicating the total heat supplied to the load equipment.

4,048,853

METHOD AND APPARATUS FOR MONITORING THE FLOW OF LIQUID AND THE LIKE

Peter David Smith, and Keith Hindle Smith, both of Blackburn, England, assignors to Detectronic Limited, Blackburn, England

Filed Dec. 9, 1975, Ser. No. 639,015

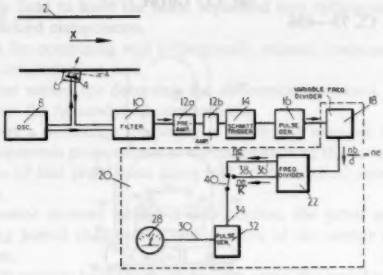
Claims priority, application United Kingdom, Dec. 11, 1974, 53598/74

Int. Cl.² G01F *1/66*

U.S. Cl. 73—194 A **11 Claims**

1. In an apparatus for monitoring the speed of flow of a liquid along a conduit provided with emitter and receiver means capable, in response to an applied driving signal, of

emitting a continuous acoustic signal of predetermined frequency into the liquid and capable of receiving at least a portion of the reflected signal which due to the Doppler effect has a different frequency than the emitted signal; said apparatus being connectable to said emitter and receiver means, the improvement comprising, oscillatory signal generating means for producing the driving signal at said predetermined frequency, filter means for demodulating the emitted frequency from the received frequency to give a first electrical output signal at a frequency equal to the Doppler difference frequency, first variable frequency divider means for dividing the



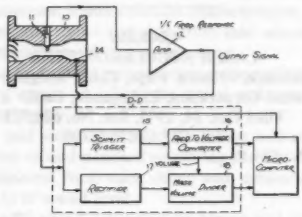
Doppler difference frequency by a first selectively variable predetermined divisor to give an electrical signal at a first quotient output frequency which is a predetermined function of the Doppler difference frequency per unit increment of liquid speed relative to the emitter and receiver means, second variable frequency divider means to further divide said first quotient frequency by a second selectively variable predetermined divisor to give an electrical signal at a second quotient output frequency correlated to the speed of the liquid, and means for utilizing said signal at the second quotient frequency to indicate variation of a parameter with respect to time which derives from movement of the liquid along the conduit.

4,048,854

SYSTEM FOR DETERMINING THE RATIO OF OIL TO WATER IN A METERED FLUID STREAM

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Division of Ser. No. 668,457, May 19, 1976, Pat. No. 4,010,645.
This application Sept. 17, 1976, Ser. No. 724,455
Int. Cl.² G01F *1/32*
U.S. Cl. 73—194 VS **8 Claims**



1. A system for metering a fluid stream constituted by a mixture of oil and water to determine the volumetric ratio of oil to water in said mixture, said system comprising:

A. a vortex meter having a flow tube through which the stream is conducted to produce a meter signal whose frequency depends on the volumetric flow and whose amplitude depends on the mass flow of the stream;

B. means solely responsive to the frequency of the meter signal to produce a volumetric flow signal;

C. means solely responsive to the amplitude of the meter signal to produce a mass flow signal;

D. means to divide the volumetric flow signal by the mass flow signal to produce a density signal;

E. means to sense the temperature of the stream passing through said tube to produce a temperature signal; and

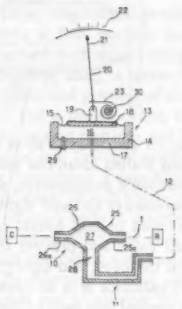
F. an electronic computer whose memory has stored therein the relationship between water density and temperature and the relationship between oil density and temperature, said computer having fed thereto said volumetric, density and temperature signals and determining the respective volumes of oil and water in said mixture.

4,048,855

LIQUID LEVEL GAUGE PARTICULARLY FOR MOTORCYCLE

Jerome Sejournet, 53, rue du Ranelagh, 75016 Paris, France

Filed Sept. 27, 1976, Ser. No. 727,154
Claims priority, application France, Sept. 29, 1975, 75.29757
Int. Cl.² G01F *23/16*
U.S. Cl. 73—299 **4 Claims**



1. A gasoline gauge, particularly for a motorcycle, for measuring the level of gasoline contained in a fuel tank, said gauge comprising a pipe line linking the lower portion of the tank and at least one carburetor, a take-off member formed in said pipe line and linked by siphon to a tube filled with gasoline when the gauge is in use, said siphon being effective to prevent passage of air into said tube when the tank is empty and said tube having a cross section sufficiently small so as effectively to attenuate pressure fluctuations due to vibrations, a pressure gauge device including a fluid-tight chamber, a wall of which includes a movable diaphragm, said chamber being linked to said tube, a removable plug arranged to close an opening in said chamber to facilitate the filling thereof with gasoline from the tank, and a display needle attached to a small plate carried by the diaphragm and adjustable by a preliminary calibration on a zero division of an indicating scale when the tank is empty.

4,048,856

QUICK SHUT-OFF DIRECT READING LIQUID LEVEL INDICATOR

Donald W. Conrad, R.D. 1, Box 300, Duncannon, Pa. 17020

Filed June 30, 1976, Ser. No. 701,488
Int. Cl.² F16K *37/00*; G01F *23/02*
U.S. Cl. 73—324 **6 Claims**

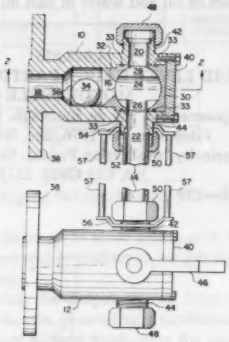
1. A direct reading liquid level indicator for monitoring liquid levels in liquid filled containers comprising:

upper and lower valves, each of said valves having a inlet lateral walled passageway and an outlet sight glass walled passageway perpendicular to said lateral passageway to allow the flow of liquid from said container to pass through said valves;

a sight glass connected between said sight glass passageways of said upper and lower valves;

ball valves located in each of said upper and lower valves between said inlet and outlet passageways to allow connection and disconnection of said lateral and sight glass passageways by a 90° rotation of said ball valves;

an auxiliary passageway extending from the exterior of each of said valves to said ball valves parallel to and on the same axis as the sight glass passageways, whereby when both ball valves are in a closed position the lateral passageways of said upper and lower valves are blocked off and an uninterrupted walled clean-out passageway is defined between said auxiliary passageways, said ball valves, said sight glass passageways and said sight glass;



a check valve located in said lateral passageways to seat against said ball valve and prevent the passage of liquid therethrough in the even said sightglass is broken while the liquid level indicator is in an open position; and

a perforated disk pressed into each of the walls of said lateral valve passageways to prevent said check ball valve from back sealing or leaving the valve.

4,048,857

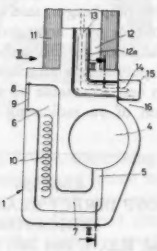
SAMPLING A STEEL CONVERTER

Friedrich Bardenheuer, Immenhofweg 57, 415 Krefeld, and Gustav Kolb, 5984 Garbeck, both of Germany

Filed Dec. 17, 1976, Ser. No. 751,592

Int. Cl.[2] G01N *1/12*

U.S. Cl. 73—354 **9 Claims**



1. A probe for sampling steel from a blowing steel converter or the like, to be fastened to a tube, comprising:

a pair of elements with complementary mold cavity halves each to define mold cavities when assembled, the mold cavities including (a) a first, inner portion for the sampled steel; (b) a downwardly oriented inlet duct communicating with the first portion; (c) a traverse duct extending from said inlet duct; and (d) an upright feeler duct leading from an entrance above a level for the inner portion to the transverse duct; and

a thermo feeler disposed above the said inner portion for measuring the steel temperature when the probe is inserted in molten steel.

4,048,858

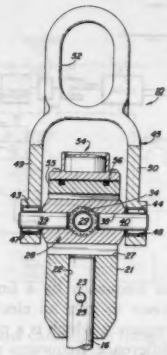
STATIC ROTOR BALANCER

Wallace F. Mitchell, Mettawa, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.

Filed Mar. 24, 1976, Ser. No. 669,897

Int. Cl.[2] G01M *1/12*

U.S. Cl. 73—486 **3 Claims**



1. Apparatus for statically balancing a rotor relative to the axis of rotation thereof, comprising

a bifurcated support member for supporting said apparatus from above with the bifurcations of said member depending therefrom,

a carrier member disposed between said bifurcations,

first shaft means journaled in said bifurcations for supporting said carrier member for pivotal movement about a first axis,

a body member,

second shaft means journaled in said body member for connecting said body member to said carrier member for pivotal movement about a second axis,

said first and second axes being mutually orthogonal, means for mounting said rotor to said body member with the axis of rotation of said rotor intersecting the point of intersection of said first and second axes, and

level indicating means carried on said body member.

4,048,859

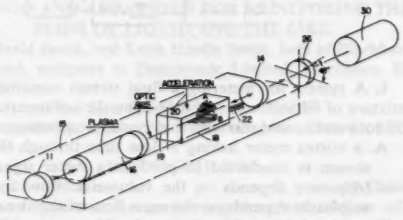
LASER ACCELEROMETER

Gary D. Babcock, Mission Viejo, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 14, 1975, Ser. No. 621,725

Int. Cl.[2] G01P *15/08*

U.S. Cl. 73—516 R **12 Claims**



4. A laser accelerometer comprising:

a chamber,
means for forming a resonant optical laser beam in said chamber,
a birefringent sensor element mounted in said chamber, said beam passing through said element,
a proof mass integral with said sensor element, said sensor element providing a substantially flexural support for the proof mass along a predetermined acceleration sensing axis and a substantially rigid support along axes normal to said predetermined axes,
means for subjecting said laser beam to a transverse magnetic field to keep the beam separated into orthogonally polarized components,
means for combining said orthogonally related components for heterodyning, and
detector means for detecting the difference frequency between the heterodyned components,
whereby a difference frequency is developed between said components proportional to the magnitude of the acceleration of said proof mass along said predetermined sensing axis,
said sensor element having a web portion, the proof mass being joined only to the web portion of the sensor element,
the web portion being in the form of a cross, the proof mass having slots formed therein which matingly engage the arms of said cross.

4,048,860

METHOD OF DETERMINING STANDARD SOUND LEVELS

Fritz Konig, Wuppertal, Germany, assignor to Losenhausen Maschinenbau AG, Dusseldorf, Germany

Filed Mar. 22, 1976, Ser. No. 668,823
Claims priority, application Germany, Apr. 30, 1975, 2519151
Int. Cl.[2] G01H *3/10*
U.S. Cl. 73—556 **4 Claims**

1. Method of determining a standardized value of the sound level generated by a sound source to be investigated, using a sound level meter, a standard sound level measuring place, a selected sound level measuring place and sound recording and sound reproduction means, said method comprising the steps of:

a. Selecting a sound source from a group of sound sources including the sound source to be investigated, said group having common sound emission characteristics,
b. recording the sound emission from said selected sound source on said sound recording means,
c. supplying said sound reproduction means with said sound recording means on which the sound emission has been stored for replay,
d. placing said sound reproduction means and said sound level meter on said standard measuring place at a predetermined distance from each other and measuring a first value (L1) of sound level,
e. placing said sound reproduction means and said sound level meter on said selected measuring place at said predetermined distance from each other and measuring a second value (L2) of sound level,
f. placing said sound source to be investigated and said sound level meter on said selected measuring place at said predetermined distance from each other and measuring a third value (L3) of sound level,

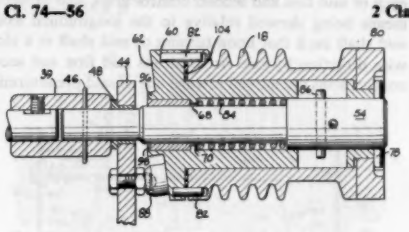
whereby the difference of said first and said second value of sound level when applied to said third value of sound level yields said standardized value of sound level.

4,048,861

DEVICE FOR OSCILLATING A ROTATING BODY ALONG ITS ROTATIONAL AXIS

Richard Paul Woidke; Thomas Joseph Wester, both of Toledo, and Eric Joseph Brosch, Grand Rapids, all of Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed Feb. 2, 1976, Ser. No. 654,319
Int. Cl.[2] F16H *25/12*
U.S. Cl. 74—56 **2 Claims**



2. A device for oscillating a rotating body along its rotational axis comprising:

a. a shaft having three longitudinal portions each having a different diameter, a first portion having the smallest diameter being an end portion and being adapted to being coupled to a rotational shaft, a second portion being located at the opposite end portion of the shaft having the largest diameter, and a third portion extending between said first and said second portions and having a diameter intermediate that of said first and second portions,
b. a cam assembly comprising a cam having a cam surface generally perpendicular to said rotational axis and facing away from the rotating body, a longitudinal support for said body rigidly attached to said cam, said support and cam having an axis coinciding with said rotational axis and having a bore therethrough whose centerline coincides with said rotational axis to receive the second and third portions of said shaft, cooperating means on the second portion of said shaft and said support for transmitting torque to said support and for providing for axial movement of said support relative to said shaft, said support having a shoulder in said bore close to the cam end of said support, and means for causing said body to rotate when said cam and support are rotated,
c. a cam follower and means maintaining said follower in fixed position slidably engaging said cam surface; and
d. spring means located around said shaft and extending between said shoulder in the bore of said support and the shoulder formed at the junction of third and second portions of said shaft in biasing said cam surface towards said cam follower, said spring means being enclosed within a substantially closed chamber defined by the surfaces of said shoulder in the bore of said support, the shoulder formed at the junction of third and second portion of said shaft, and substantial portions of the third portion of said shaft and the bore of said support.

4,048,862

LINKAGE FOR CONTROLLING TWO INDEPENDENT POWER UNITS

Joseph C. Hurlburt, Leola; Howard R. Brown, Nottingham, and Ernest E. Buck, Reamstown, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Oct. 14, 1975, Ser. No. 622,189
Int. Cl.[2] F16H *25/12*
U.S. Cl. 74—57 **8 Claims**

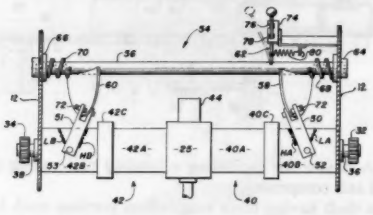
1. Linkage for controlling at least two independent power units disposed in a predetermined alignment, said power units having first and second control arms moveable between first and second predetermined positions for changing the operation of said units, said linkage comprising:

a. a shaft disposed substantially parallel to the aligned power units;

b. means for mounting the shaft for rotational and axial movement relative to said power units;

c. drive means for turning said shaft about its longitudinal axis; and

d. means projecting from said shaft and slideably engaging each of said first and second control arms, said projecting means being skewed relative to the longitudinal axis of said shaft such that upon turning of said shaft in a clockwise direction by said drive means said first and second control arms are moved toward one of said predetermined



first and second positions respectively and upon turning of said shaft in a counterclockwise direction said first and second control arms are moved toward the other one of said predetermined first and second positions;

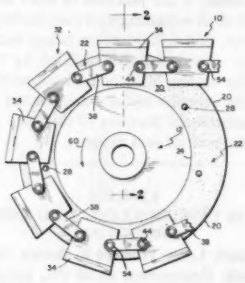
e. should one of said control arms reach one of said predetermined positions prior to the time the other control arm reaches its corresponding predetermined position then upon further turning of said shaft said projecting means slides on said control arm which has reached its predetermined position and thereby forces the shaft to move axially causing the other control arm to reach its predetermined position.

4,048,863

FRICTION DRIVE

Robert E. Pemberton, R.R. No. 2, Box 123, Edinburg, Ind. 46124

Filed June 24, 1976, Ser. No. 699,487
Int. Cl.² F16H 7/00, 7/18
U.S. Cl. 74—229 **11 Claims**



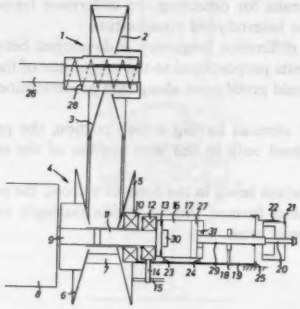
1. A friction drive comprising, in combination, a wheel having an annular friction band mounted thereon adjacent the wheel outer periphery on each outer axial side thereof; and a chain having a plurality of pivotally connected friction links trained over the wheel perimeter, said links being shaped for mating frictional engagement with said friction bands upon rotation of said wheel.

4,048,864

DRIVE WITH CONTINUOUSLY ADJUSTABLE SPEED VARIATION

Helmut Ritter, Wattwil, Switzerland, assignor to Heberlein Maschinenfabrik AG, Wattwil, Switzerland

Filed July 23, 1976, Ser. No. 707,960
Claims priority, application Switzerland, July 28, 1975, 9730/75
Int. Cl.² F16H 55/52
U.S. Cl. 74—230.17 F **6 Claims**



1. For use in a belt driving mechanism providing a speed ratio that is infinitely variable between predetermined limits, an adjustable pulley mechanism comprising a driving member rotatable about an axis, a first conical disc coaxially fixed to said driving member, a second conical disc coaxially mounted on said driving member to slide towards and away from said first conical disc, said conical discs being mounted to provide an annular wedge-shaped groove therebetween tapering towards said axis for receiving in said groove a belt having a wedge-shaped cross-section, a hollow cylindrical thrust member for thrusting said second disc towards said first disc mounted coaxially with said discs for axial movement, a thrust bearing interposed between said thrust member and said second disc, means holding said thrust member in a set position about said axis, an element mounted to reciprocate within said thrust member, two abutment members respectively mounted for limiting opposite ends of the reciprocating movement of said element, a rod connected to said element for reciprocation therewith, said rod protruding from said thrust member at an end thereof remote from said discs, an abutment member adjustably mounted on said rod beyond said thrust member, said abutment member being adapted for fixing to said rod in any one of a range of positions thereon and for abutting against said end of said thrust member on movement of said rod in a direction towards said discs, and means for actuating said element to move from one of said abutments to the other of said abutments while initially moving said abutment member, by way of said rod, into engagement with said thrust member and thereafter moving said thrust member and said second disc from an initial position axially towards said first disc, whereby the distance moved by said second disc is the difference between the total stroke of said reciprocable element between said abutment members and the distance moved by said abutment member prior to engaging said thrust member.

4,048,865

TRANSMISSION BELTS

Richard Bell, Dumfries, Scotland; Takao Sato, Yamatokoriyama, Japan, and Chitta Ranjan Lahiri, Naugatuck, Conn., assignors to Uniroyal Limited, Midlothian, Scotland; Uniroyal, Inc., New York, N.Y. and Unitta Company Limited, Osaka, Japan

Filed Apr. 9, 1976, Ser. No. 675,358

Claims priority, application United Kingdom, Apr. 11, 1975, 14957/75

Int. Cl.[2] F16G *1/00*; D04H *1/00*

U.S. Cl. 74—231 R 13 Claims

1. A toothed power transmission belt comprising a body having transversely extending teeth positioned along at least one face of said body, and an inextensible tensile member embedded in said body, the material of said body and said teeth comprising a blend of an epihalohydrin having a nominal Mooney viscosity of not more than 50 and an epihalohydrin having a nominal Mooney viscosity of not less than 50, wherein the ratio of the lower viscosity epihalohydrin to the higher viscosity epihalohydrin in said body material is from 60:40 to 75:25 by weight.

4,048,866

APPARATUS FOR USE IN CONTROLLING THE TENSION OF A CHAIN OR CHAINS OF MINING EQUIPMENT

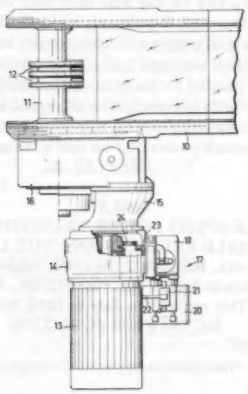
Walter Weirich, Dortmund, and Willy Kussel, Altlunen, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westphalia, Germany

Filed Aug. 11, 1976, Ser. No. 713,537

Claims priority, application Germany, Aug. 14, 1975, 2536258

Int. Cl.[2] F16H *7/12*

U.S. Cl. 74—242.1 FP 9 Claims



9. Apparatus for controlling the tension in a chain of mining equipment driven with a drive system; said apparatus comprising a gearing unit providing a reduction ratio and having an output drive, means for selectively coupling the output drive of the gearing unit to the drive system for the chain, a multi-piston hydraulic motor for driving the gearing unit, means for providing an oil-water emulsion as motive fluid for operating the motor and a pipe connected with the interior of the motor and extending above the motor to form a fluid trap to maintain fluid inside the motor.

4,048,867

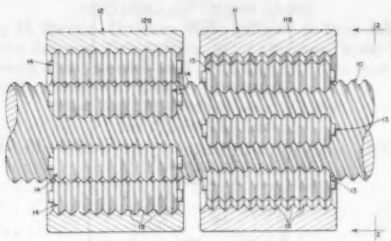
MECHANICAL DEVICE CONVERTING ROTARY INPUT TO LINEAR COMPRESSION OR STRETCHING OUTPUT WITH A HIGH MECHANICAL ADVANTAGE

Oliver Edward Saari, Minneapolis, Minn., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed June 1, 1976, Ser. No. 691,671

Int. Cl.[2] F16H *1/18*

U.S. Cl. 74—424.8 B 6 Claims



1. In a rotary to linear device, a screw member and a pair of jaw assemblies, said screw member having multiple-lead threads, each of said jaw assemblies comprising an outer member and a independent plurality of roller members equal in number to the number of thread starts on said screw member, each of said roller members having a plurality of annular teeth of substantially equal axial pitch and substantially matching configuration to the teeth of said screw member, each outer member of said jaw assemblies having a bore therethrough including a plurality of internal annular grooves of substantially equal pitch and complementary shape to the annular teeth of said roller members, the number of annular grooves in each of said outer members being substantially equal to the number of annular teeth on each of said roller members, the roller members of each of said jaw assemblies mounted in substantially equally spaced-apart positions orbit about the periphery of said screw member with said annular teeth thereof in rolling contact with the threads of said screw member and the grooves in said outer members, and the pitch diameters of the roller members and the annular grooves of the outer member of one of said jaw assemblies being greater than the corresponding pitch diameters of the other of said jaw assemblies.

4,048,868

INTERRUPTED INTERMITTENT MOTION DEVICE

William E. Lock, 183 Wygant Road, Horseheads, N.Y. 14845

Filed June 18, 1976, Ser. No. 697,664

Int. Cl.[2] F16H *27/04*

U.S. Cl. 74—436 2 Claims

1. An interrupted intermittent motion device, comprising:

a. a rotatable input drive shaft;

b. a primary driver wheel disposed on said input drive shaft, with said primary driver wheel having an internal surface, a locking groove in said internal surface, and a driver roller connected to and protruding from said internal surface;

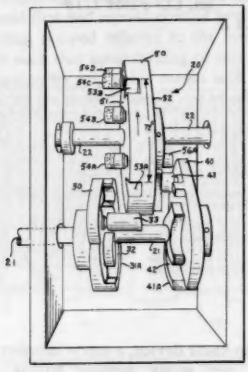
c. a secondary driver wheel disposed on said input drive shaft, with said secondary driver wheel having an internal surface facing said internal surface of said primary driver wheel, a locking groove in said internal surface, and a driver roller connected to and protruding from said internal surface;

d. a two-sided indexing driven wheel having:

1. a first side surface facing said internal surface of said primary driver wheel, with said first side surface having four adjacent and circumferentially-spaced drive slots therein which are dimensioned and configurated, individually and separately, to accept, engage with, and

releasably hold said driver roller of said primary driver wheel, and with said first side surface also having six locking rollers connected to and protruding from said first side surface;

2. and, a second side surface facing said internal surface of said secondary driver wheel, with said second side surface having one drive slot therein dimensioned and



configurated to accept, engage with, and releasably hold said driver roller of said secondary driver wheel, and with said second side surface also having two locking rollers connected to and protruding from said second side surface;

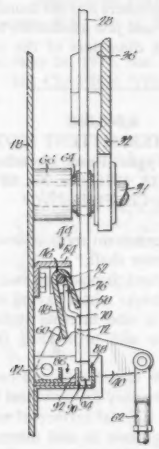
e. and, a rotatable output shaft on which is disposed said two-sided indexing driven wheel.

4,048,869

SHIFTING MECHANISM FOR CONTROL ELEMENTS

Donald L. Johnson, Kenosha, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 28, 1976, Ser. No. 681,267
Int. Cl.² G05G 9/00
U.S. Cl. 74—471 R **9 Claims**



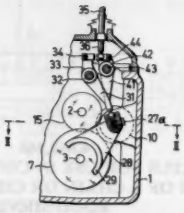
1. A shifting mechanism including a control lever rotated on a fixed axis adjacent a control member having a recess receiving a portion of said lever so that movement of said control lever will move said control member to a plurality of distinct positions, said lever being pivoted between first and second positions about a second axis perpendicular to said fixed axis, a control element pivoted about a third axis spaced from said second axis, and cooperating means between said control lever and said control element for moving said control element between positions in response to pivotal movement of said control lever between said positions, said cooperating means accommodating rotational movement of said lever about said fixed axis in any position for said control element, said lever being pivotable about said second axis between said first and second positions at each of said distinct positions of said control member so that said control element can be moved between positions of any of said distinct positions of said control member.

4,048,870

CHANGE GEAR TRANSMISSION FOR MOTOR VEHICLES, ESPECIALLY FOR USE IN AGRICULTURE AND CONSTRUCTION

Karl-Heinz Hulsebusch, Cologne, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed June 17, 1976, Ser. No. 697,131
Claims priority, application Germany, June 18, 1975, 2527052
Int. Cl.² G05G 9/14
U.S. Cl. 74—473 R **9 Claims**



1. A change gear transmission for motor vehicles, especially for use in agriculture and construction, which includes: a transmission housing, a shift stage comprising gear means arranged in said transmission housing, shifting means comprising axially displaceable shift fork menas and operable to control said shift stage, shift rod means arranged within said transmission housing and having said shift fork means connected thereto and supported thereby, an input shaft and an output shaft both arranged within said transmission housing, an auxiliary shaft likewise arranged within said transmission housing and extending parallel to one of said other shafts, said shift rod means being coaxially arranged with regard to said auxiliary shaft, said auxiliary shaft being non-rotatably journalled, and gears freely rotatably mounted on said auxiliary shaft.

4,048,871

VARIABLE SPEED POWER TRANSMISSION FOR SMALL VEHICLES AND THE LIKE

Norman G. Fyock, R.D. No. 2, Box 400, Johnstown, Pa. 15904

Continuation-in-part of Ser. No. 592,384, July 2, 1975, abandoned. This application July 6, 1976, Ser. No. 703,064
Int. Cl.² F16H 47/04, 57/10
U.S. Cl. 74—687 **19 Claims**

1. A power transmission apparatus, comprising

a first shaft,

a second shaft,

a rotatable housing member supported for independent rotation with respect to the first and second shafts,

a housing shaft rotatably supported in the housing and in spaced, parallel relation to the first and second shafts,

a first gear means in the housing comprising a gear connected to the first shaft for rotation therewith, and a second gear rotatably connected with said housing shaft, said gears being connected in driving relation one to the other,

a second gear means in the housing comprising a gear rotatably connected to said housing shaft and a gear connected

for rotating the second shaft, said gears being connected in driving relation one to the other,

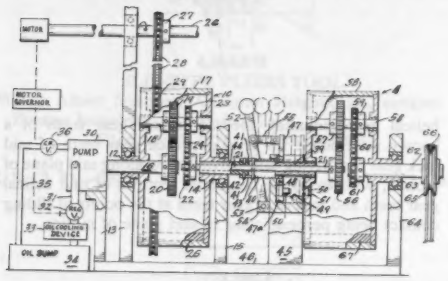
rotary drive means connected to the housing for rotating the latter,

a variable resistance means connected to the first shaft operable for resisting rotation thereof,

the second shaft being driven at variable speed responsive to variations of resistance of said resistance means, and

means connected to said resistance means operable for varying the resistance of rotation of the first shaft.

11. A power transmission comprising in combination a primary transmission device having variable speed output drive, a secondary transmission device in series with said primary



device and having forward and reverse modes, said secondary device being connected to said output drive of the primary device and to a driven rotary load, a power drive means connected to operate the said primary device in one direction of rotation, a variable control means consisting of a fluid pump and a flow regulation means connected to the primary transmission device for varying the speed output thereof independent of variation of the driving speed of the power means, and a control shift device for connecting the primary and secondary transmissions to produce a direct drive therebetween in the forward mode of the secondary device and a variable drive of multiple gear ratio between the two in either of the forward and the reverse modes of the secondary device.

4,048,872

CONTROL COUPLINGS

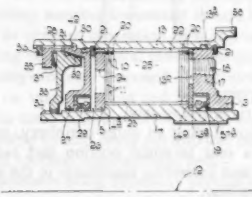
Oswald Webb, Whitley, England, assignor to GKN Transmissions Limited, Erdington, England

Filed May 28, 1975, Ser. No. 581,690

Claims priority, application United Kingdom, May 28, 1974, 23526/74

Int. Cl.² F16H *1/44*

U.S. Cl. 74—711 **11 Claims**



1. A control coupling comprising a liquid-tight enclosure, first and second sets of mutually interleaved elements within said enclosure and arranged for rotation about a common axis, a viscous liquid within said enclosure, said liquid being in contact with adjacent working surfaces of said elements, said first and second sets of elements being arranged for driving connection with first and second rotatable members respectively, a clutch outside said enclosure, resilient means urging said clutch to a disengaged state and pressure responsive means in communication with said enclosure and arranged to directly sense the level of liquid pressure in said enclosure, said pressure responsive means being arranged upon the attainment of a predetermined liquid pressure level in said enclosure to be displaced axially of the coupling by said predetermined pressure level thereby bringing said clutch into engagement against the action of said resilient means.

4,048,873

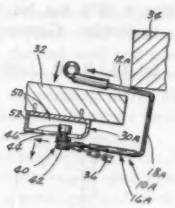
DOOR SECURITY LOCK OPENING TOOL AND METHOD OF USING SAME

Henry H. Stevens, Ottumwa, Iowa, assignor to Tony Johnson; Eloise Johnson; Dale Stevens, all of Ottumwa, Iowa; Doyle Stevens; Tom Stevens, both of Longmont, Colo. and Fern Casady, Centerville, Iowa

Filed Aug. 10, 1976, Ser. No. 713,256

Int. Cl.² B25B *27/00*

U.S. Cl. 81—3 R **6 Claims**



1. A tool for unlatching door security locks of the type having a chain extending from the door frame to a slider movable in an access opening at the inner end of a slot in a plate secured to the door and forming a passageway between the plate and door open at the end adjacent the door edge, said tool comprising,

a U-shaped elongated member having an actuating leg and a handle leg interconnected by a base portion wherein the outer end of said actuating leg positioned on the inside of the door is adapted to engage said slider in said passageway or on the outside of the said plate for moving the slider in said slot towards said access opening for removal therefrom as a person moves the handle leg along a line parallel to the longitudinal axis of said slot and passageway, and

said actuating leg including telescopically extendable sections for varying the length thereof.

4,048,874

HAND TOOL

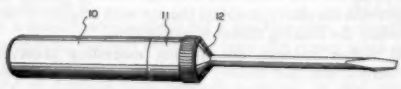
Arthur John Riches, Herne Bay, England, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jan. 20, 1975, Ser. No. 542,141

Claims priority, application United Kingdom, Jan. 21, 1974, 02752/74

Int. Cl.² B25B *17/00*

U.S. Cl. 81—57.31 **9 Claims**



1. A clutchless hand tool, adaptable for use for manipulation with but one hand, for selectively making coarse and fine adjustments comprising:

a handle;

an output member coupled to said handle for axial rotation relative to said handle;

an actuating member mounted on said handle for axial rotation relative to said handle; and

a reduction gear means coupling said actuating member to said output member,

said output member including a coaxial shaft which extends from the output member through a bore in said gear means and through a bore in said handle where it is restrained,

whereby coarse adjustments of said hand tool can be performed by rotating said tool with said one hand, and

whereby fine adjustments of said hand tool can be performed by holding said handle, against rotation, with said one hand, while simultaneously rotating said actuating member with at least one finger of said one hand.

4,048,875

APPARATUS FOR SCREWING A THREADED NUT ONTO A STEEL ROD

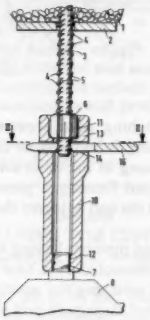
Richard Heinen, New York, N.Y., and Georg Rieger, Unterpfaffenhofen, Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

Filed Nov. 9, 1976, Ser. No. 739,870

Claims priority, application Germany, June 12, 1976, 7618699[U]

Int. Cl.² B25B *13/48*

U.S. Cl. 81—125 **14 Claims**



1. A device for screwing a threaded nut onto a rod of the type which has a partial spiral winding made up of spirally arranged ribs positioned on opposite sides thereof to leave substantially planar areas on opposite sides of the rods between the ribbed areas, the ribs sloping in opposite directions in passing from the planar areas, said device comprising a tubular sleeve adapted to surround a substantial length of ribbed rod and having

a recess at a first end adapted to receive a nut to be screwed into the rod,

means at the opposite end adapted to receive a driving means for imparting a twisting moment thereto,

locking means cooperating with said sleeve adapted to releasably lock the sleeve onto a portion of the rod which extends through a threaded nut to which the first end of the sleeve is applied whereby rotation of the sleeve also rotates the rod when said locking means is operative, but permits the sleeve to rotate the nut with respect to the rod when the locking means is inoperative,

said sleeve contains an opening extending transversely thereof, and said locking means operates in said opening.

4,048,876

ADJUSTABLE OPEN END WRENCH

William A. Cagle, 2414 Decotts Ave., Sanford, Fla. 32771

Filed Oct. 14, 1976, Ser. No. 732,422

Int. Cl.² B25B *13/16*

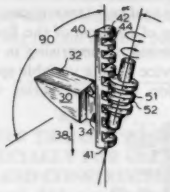
U.S. Cl. 81—165 **13 Claims**

1. An adjustable open end wrench comprising in combination:

a stationary jaw attached to a head section of said adjustable open end wrench;

a movable jaw slidably mounted on said stationary jaw for moving toward and away from said stationary jaw for defining a plane of motion therebetween;

a rack gear coupled to said movable jaw; and



a helical gear including thereon helical gear teeth of a known pitch angle for engaging rack gear teeth of said rack gear for driving said movable jaw along said plane of motion, with engaging tangential sections of said helical gear teeth and said rack gear teeth at the points of sliding contact being perpendicular to said plane of motion.

4,048,877

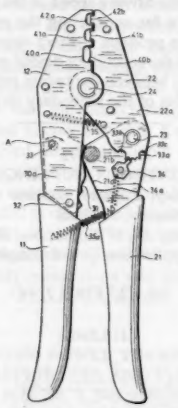
DEVICE, PARTICULARLY OF THE PLIERS OR SCISSORS TYPE

Hans Undin, Akersberga, Sweden, assignor to Pressmaster Ltd., Stockholm, Sweden

Filed Jan. 8, 1976, Ser. No. 647,437

Int. Cl.² B21D *9/00*; B25B *7/02*

U.S. Cl. 81—313 **7 Claims**



1. A tool comprising

i. a stationary first working jaw,

ii. a first extension having an outer periphery, an inner periphery and a rear terminal portion and being rigidly connected to and extending essentially in the same direction as the first jaw,

iii. a movable second working jaw, journalled to the first jaw in a first pivot point located intermediate the first jaw and the first extension,

iv. an elongated cam profile arranged at the inner periphery of the first extension intermediate the first pivot point and the rear terminal portion of the first extension,

v. a second extension formed on the second jaw on the reverse side from the first pivot point than where the second jaw is located and having an outer periphery, an inner periphery and a rear terminal position,

vi. an elongated drive means having an outer periphery, an

inner periphery and a rear terminal portion and being journalled to the second extension in a second pivot point located in the rear terminal portion of the second extension,

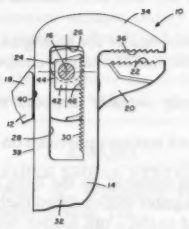
vii. a cam follower means arranged at the inner periphery of the drive means, intermediate the second pivot point and the rear terminal portion of the drive means, and adapted, when the drive means is actuated by a driving force, to be pressed against the cam profile and to follow it so that the rear terminal portion of the second extension is moved away relative to the cam profile to an extent which is defined by the shape of the cam profile.

4,048,878

SLIP-TYPE PLIERS TOOL

Walter Albert Nystrom, Arlington Heights, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 5, 1976, Ser. No. 673,575
Int. Cl.² B25B *7/04*
U.S. Cl. 81—409 **1 Claim**



1. An improved slip-type pliers tool comprising in combination:

a first jaw member having a handle portion, a jaw head portion including an engaging surface, a shoulder on a side surface thereof, a cam portion projecting from said side surface spaced from said shoulder and a pivot hole extending through said jaw member and cam portion and eccentric to said cam portion;

a second jaw member having a handle portion, a jaw head portion including an engaging surface, an internal slot extending therethrough and receiving said cam portion, a toothed edge surface in said slot, and an exterior edge surface arranged to engage said shoulder;

a pivot pin having a head and a reduced body portion located in said hole and extending through said slot; a pivot pin retaining member connected to said body portion and located to prevent separation of said jaw members while permitting relative pivotal movement therebetween;

a ratchet dog movably disposed in said slot, said dog being located on said pivot pin and having a toothed edge arranged to mate with the toothed edge surface of said slot and movable by said pivot pin into and out of engagement with said toothed edge surface; and,

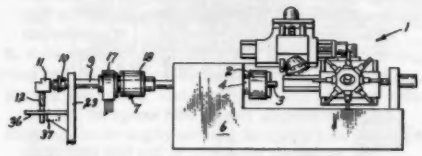
said jaw members being relatively pivotal on said pivot pin between an open position of said tool wherein said ratchet dog and toothed edge surface are out of engagement and the distance between said engaging surfaces can be varied by sliding movement of said jaw members and a closed or engaging position wherein said ratchet is in engagement with said toothed edge portion preventing sliding adjustment and the shoulder on said first jaw member is in engagement with the exterior edge surface on said second jaw member limiting the pivotal movement of said jaw members and retaining said engaging surfaces in a generally parallel, spaced relationship.

4,048,879

STOCK SENSING DEVICE

Joseph Henry Cox, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 12, 1976, Ser. No. 741,206
Int. Cl.² B23B *19/00, 13/02*
U.S. Cl. 82—28 R **9 Claims**



1. In a machine tool, an apparatus for sensing the presence of a workpiece, comprising:

a channel adapted to receive a workpiece at one end;

means for directing a pressurized fluid into said channel;

a seal around said channel, said seal adapted to yieldably engage the periphery of a workpiece extending through the channel and cooperating therewith to restrict fluid flow from the channel whereby a backpressure is maintained in the channel;

means for sensing the backpressure in the channel and operable to produce a workpiece present signal when the backpressure exceeds a predetermined level; and

means responsive to the workpiece present signal for controlling functions of the machine tool.

9. In a machine tool, having a chuck with work gripping members for holding a workpiece being machined, an apparatus for sensing sufficient chuck stock, comprising:

a channel adapted to receive a workpiece at one end, said channel extending into the chuck;

means for directing a pressurized fluid into said channel;

a plurality of flow passages for said pressurized fluid, said passages being proximally located to said chuck and having unequal flow resistances including at least one flow passage through a labyrinth bushing adapted to encompass a workpiece and a flow passage through said workpiece channel;

means for sensing the backpressure in the channel and operable to produce a workpiece present signal when the backpressure exceeds a predetermined level; and

means responsive to the workpiece present signal for controlling functions of the machine tool.

4,048,880

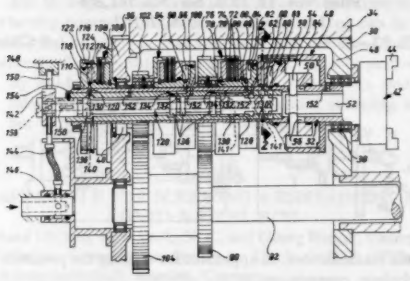
SYSTEM FOR SUPPLYING HYDRAULIC FLUID TO AGGREGATES ON SPINDLES OR THE LIKE

Helmut Link, Schanbach, Germany, assignor to Index-Werke KG Hahn & Tessky, Esslingen, Germany

Division of Ser. No. 385,479, Aug. 3, 1973, abandoned. This application Feb. 9, 1976, Ser. No. 656,584
Claims priority, application Germany, Aug. 8, 1972, 2238986
Int. Cl.² B23B *19/02, 3/34*
U.S. Cl. 82—29 R **17 Claims**

1. In a spindle arrangement for a machine tool, a combination comprising support means; at least one rotary work supporting spindle member mounted in said support means; a plurality of fluid-operated devices mounted on said rotary work supporting spindle member, said devices including at least one clutch device, at least one brake device, and at least one work clamping device; a source of pressurized fluid; and control means for connecting selected devices with said source and for permitting selected devices to discharge control fluid, said control means comprising a valve member, one of said members being hollow and surrounding the other of said members, said valve member being movable axially of said work supporting spindle member between a plurality of positions in

each of which at least one of said devices is connected with the source while the other are free to discharge control fluid, and



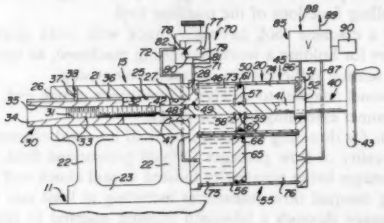
actuating means for moving said valve member between said positions.

4,048,881

TAILSTOCK POWERING DEVICE

Horace C. Disston, Jr., Cherry Hill, N.J., assignor to Van Wood Manufacturing Co., Inc., Cherry Hill, N.J.

Filed Apr. 14, 1976, Ser. No. 676,691
Int. Cl.² B23B *23/00*
U.S. Cl. 82—31 **5 Claims**



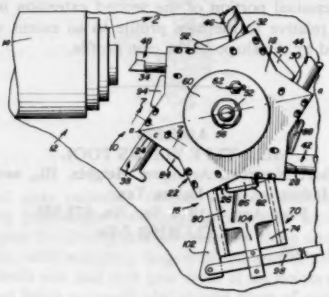
1. A tailstock power device for a tailstock having a housing selectively positionable on a bed, a carrier mounted in said housing for longitudinal shifting extensile and retractile movement with respect to said housing, and an actuating shaft threadedly engaged with said carrier in said housing and extending exteriorly therefrom for threaded rotation relative to said carrier and shifting movement therewith, said device comprising: a first cylinder for mounting on said housing and surrounding said shaft with the latter extending in slidable and rotatable sealed relation through said cylinder, a first piston shiftable in said first cylinder and connected to said shaft for shifting movement with said shaft and carrier, fluid operating means selectively communicable with said cylinder to drive said piston is a desired direction for selective movement and positioning of said shaft and carrier, said shaft being rotatable upon fixed positioning of said piston in threaded engagement with said carrier to shift the latter, a second cylinder, a second piston shiftable in said second cylinder, and fluid operating means comprising a source of pressure fluid selectively communicable with said first mentioned cylinder on one side of sad first mentioned piston to feed said carrier and selectively communicable with said second cylinder on one side of said second piston to feed the latter, metering means communicable between said first mentioned cylinder on the other side of said first mentioned piston and said second cylinder on the other side of said second piston to meter fluid passing therebetween upon feeding of said carrier, and one-way valve means communicable in the direction between said second cylinder on said other side of said second piston and said first cylinder on said other side of said first piston, for rapidly returning metered fluid and consequently rapidly returning of said carrier.

4,048,882

POST TURRET TOOL HOLDER FOR ENGINE LATHES

Richard F. Watkins, 1168 Oak Glen Road, Santa Ynez, Calif. 93460

Filed Aug. 11, 1976, Ser. No. 713,608
Int. Cl.² B23B *29/00*
U.S. Cl. 82—36 A **3 Claims**



1. A post turret tool holder for an engine lathe, including a work holder and a tool holder station, comprising, in combination:

a. a rotatable body member disposed at the tool holder station;

b. a plurality of tool retainers provided on the body member; and

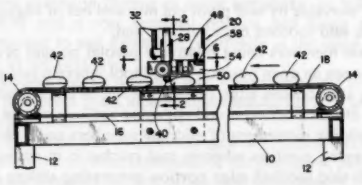
c. indexing means mounted on the lathe for restraining the body member against motion when each of the tool retainers is presented to the work holder, while permitting the body member to be rotated from tool retainer to tool retainer relative to the work holder, and the tool retainers being repeatedly positioned accurately with respect to the work holder by the indexing means, the indexing means including a slide guide affixed to the lathe at the tool holder station, a slide movably disposed in the guide and provided with a recess, and projections mounted on the body member and associated with the tool retainers for sequentially engaging in the recess and restraining the body member from rotation, the indexing means further including a slot provided in the slide and communicating with the recess for permiting the slide to spread and snap onto the projections in order to tightly engage the projections and permit movement of the projections relative to the slide.

4,048,883

BAND-TYPE ROLL SLICING MACHINE

Dale S. Lecrone, 4447 Bonnymede, Jackson, Mich. 49201

Filed Sept. 16, 1976, Ser. No. 723,918
Int. Cl.² B26D *3/28*
U.S. Cl. 83—4 **16 Claims**



1. A band type roll slicing machine comprising a substantially horizontal endless conveyor supported for movement in a direction to support and feed a plurality of rolls simultaneously in a predetermined direction, an endless band type

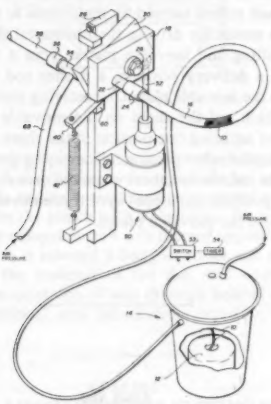
knife supported adjacent said conveyor and one section of said knife being disposed transversely and parallel to said conveyor in spaced relationship above the upper surface thereof a predetermined distance between the top and bottom surfaces of rolls to be sliced thereby, and power means to drive said conveyor and knife in operative directions; in combination with pressure means mounted above and substantially in vertical alignment with said section of said knife and supported for limited yieldable movement away from said conveyor, means engaging said pressure means and exerting relatively light pressure thereon toward said conveyor, said pressure means comprising a series of relatively narrow rollers operable upon axes extending transversely to the direction of movement of said conveyor and spaced apart axially relatively short distances to form a nested arrangement of said rollers to permit a plurality of said rollers simultaneously to engage the upper surfaces of rolls upon said conveyor in locations both transverse and longitudinal to and extending substantially in parallel relationship to the path of movement of said conveyor, and friction means on the peripheries of said rollers engaging the upper surfaces of said rolls with light pressure as carried by said conveyor into contact with said section of said knife to minimize lateral movement of said rolls from said path of movement thereof while being sliced and also hold said rolls in frictional engagement with said conveyor without unduly compressing or deforming the upper surfaces of rolls and thereby also maintain the upper and lower portions of rolls in superimposed vertical relationship when the same have the slicing thereof into said upper and lower portions completed.

4,048,884

FIBER SHEAR SYSTEM

James Buchanan Winn, Jr., Wimberley, Tex., assignor to The Archilithic Company, Dallas, Tex.

Filed Dec. 15, 1975, Ser. No. 640,874
Int. Cl.[2] B26D *7/06*
U.S. Cl. 83—24 **10 Claims**



1. An apparatus for controlling the flow of fibrous material and selectively shearing the material which comprises:
- a first shear element having an aperture in a plane face thereof,
- an input tube attached to said first shear element for feeding the fibrous material through the aperture in said first shear element,
- a second shear element rotatably attached to said first shear element and having an aperture in a plane face thereof alignable with the aperture in said first shear element with the plane faces in confronting relation,
- an egress tube attached to said second shear element for receiving the material from the aperture in said second shear element when the apertures in said first and second shear elements are aligned,
- means for moving the fibrous material through said input tube and out of said egress tube when the apertures in said first and second shear elements are aligned, and
- rotation means for rotating said second shear element and said egress tube relative to said first shear element to shear the material passing through the apertures in said first and said second shear elements and to stop the flow of material therethrough.

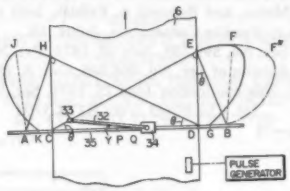
8. A method for controlling the flow of continuous fiber roving and selectively shearing the roving comprising:
- passing the roving under pressure into an input tube and through an egress tube closely aligned therewith,
- shearing the roving by moving the egress tube relative to the input tube and out of alignment therewith, and
- blocking the end of the input tube when the input tube is misaligned with the egress tube to stop the flow of roving therethrough.

4,048,885

METHOD AND APPARATUS FOR CUTTING CONTINUOUSLY MOVING SHEET MATERIAL BY JET STREAM OF FLUID UNDER HIGH PRESSURE

Hiroshi Miyakita, and Ichiro Miyakita, both of Toyonaka, Japan, assignors to Ichiro Miyakita, Toyonaka, Japan

Filed Mar. 15, 1976, Ser. No. 666,544
Claims priority, application Japan, Mar. 17, 1975, 50-32781; Jan. 30, 1976, 51-9556
Int. Cl.[2] B26F *3/00*; B26D *1/56*
U.S. Cl. 83—38 **9 Claims**



5. An apparatus for cutting a web of sheet material continuously fed at a predetermined velocity into sheets of predetermined length by a jet stream of fluid under pressure, comprising a jet nozzle for directing a jet stream of fluid under high pressure having energy sufficient to cut said sheet material, a carriage adapted for making reciprocating movement along a straight track, an arm mounting said nozzle at one end thereof and pivoted at the other end thereof to said carriage, and drive means for causing reciprocating movement of said carriage along said straight track at a controlled velocity and causing alternate normal and reverse swinging movement of said arm around the pivot at a controlled angular velocity.

4,048,886

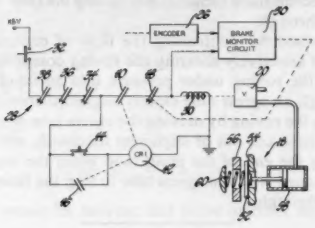
BRAKE MONITOR WITH SELF-CHECKING

John Francis Zettler, Stow, Mass., assignor to Xenex Corporation, Birmingham, Mich.

Filed Sept. 16, 1976, Ser. No. 724,059
Int. Cl.[2] B21J *7/46*
U.S. Cl. 83—58 **22 Claims**

1. A brake monitor for a press having clutch means, brake means and control means for alternately starting and stopping the press crank in a cycle of operation, said monitor comprising: a signal circuit adapted to be connected with the press to produce a brake signal at the start of braking, a timing circuit responsive to the brake signal for generating a timing signal having a value which is a function of time, said signal circuit being connected with the timing circuit for starting the timing signal, detecting means connected with the timing circuit for

producing logic signals indicative of the value of the timing signal relative to reference signals representing stopping times for the press, motion stop detecting means adapted to be connected with the press for generating a motion stop signal when the press comes to a stop, memory means connected with the detecting means for storing said logic signals in response to a motion stop signal, a relay circuit adapted to be connected



with said control means of the press for shutting down the press in response to a disabling signal, and logic means connected to said memory means and producing a disabling signal when said logic signals represent a timing signal indicative of excessive stopping time, said logic means being connected with the relay circuit to apply the disabling signal thereto for shutting down the press when the stopping time is excessive.

4,048,887

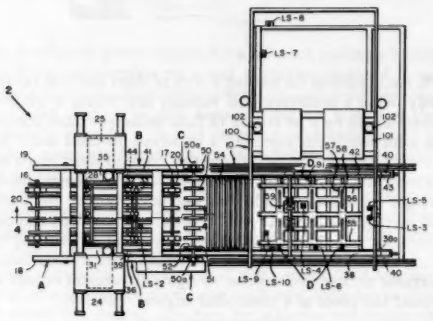
MACHINE FOR TRIMMING THE EDGES OF PANELS

Donald B. Morse, and Bernard A. Pribish, both of Joliet, Ill., assignors to Kemlite Corporation, Joliet, Ill.

Division of Ser. No. 599,335, July 28, 1975, Pat. No. 3,990,335, which is a division of Ser. No. 404,105, Oct. 5, 1973, Pat. No. 3,922,940. This application June 25, 1976, Ser. No. 699,954

Int. Cl.[2] B26D *7/06;* **B27B** *5/04*

U.S. Cl. 83—79 **7 Claims**



1. A machine for trimming the edges of panels comprising a first pair of spaced saws, means for passing a panel in one direction past said first pair of saws to trim the side edges off said panel, a second pair of spaced saws, a carriage reciprocally movable in a direction angularly displaced from sid one direction, a rack, means for passing the panel to a position on said rack after the panel has been trimmed by said first pair of spaced saws, means for supporting said rack above the bed of said carriage, said supporting means including a fluid cylinder, means sensitive to the arrival of the panel at said position for deactivating said fluid cylinder to permit said rack with a panel thereon to descend to the bed of said carriage, means for holding the panel in fixed position on said carriage, and power means for moving said carriage with said panel thereon past said second pair of saws whereby to trim the end edges of the panel.

4,048,888

MACHINES FOR CUTTING CARDBOARD AND OTHER ARTICLES

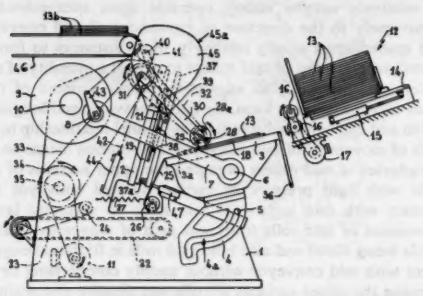
Louis Antoine Bonnard, 49, rue Gaspard Picard, Venissieux, France (69200), and Claude Raymond Pierron, 32, avenue Gambetta, St Cyr au Mt d'Or, France (69450)

Filed Sept. 24, 1976, Ser. No. 726,333

Claims priority, application France, Oct. 22, 1975, 75.32985

Int. Cl.[2] B26D *7/06*

U.S. Cl. 83—89 **8 Claims**



1. A machine for cutting cardboard and other articles comprising a frame; a platen affixed to the frame substantially vertically thereon, a movable platen pivotally mounted on the frame, a horizontal shaft carried by the frame to impart an oscillating movement to the movable platen and rods pivoted on the shaft and to the movable platen, a chassis, parallel arms pivoted on the chassis and a transverse shaft mounted in the frame, a chain and chain wheels mounted on the shaft, a crank on the horizontal shaft to which one end of the chassis is affixed and a cylinder mounted on the frame to which the opposite end of the chain is affixed, a cam track mounted on the frame and rollers carried by the chassis to engage the cam track and a motor for driving the horizontal shaft, rotation of the shaft lifting the movable platen from a sheet receiving position to a delivery position, a pusher rod for feeding the sheets onto the movable platen, a centering member and blades thereon which cut the sheet on the movable platen, suction members for securing one portion of the sheet on the movable platen whilst the other portion falls away by gravity, means for releasing the suction members when the movable platen is in its horizontal position and a conveyor for removal of the portions released from the movable platen.

4,048,889

ELASTOMERIC STRIPPER HAVING METAL HEAD AND STRIPPING PLATES

George C. Finley, 242 E. Fitzgerald Road, Gerald, Mo. 63037

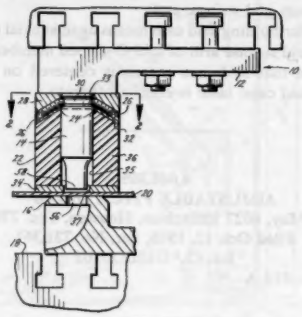
Filed July 7, 1975, Ser. No. 593,277

Int. Cl.[2] B26D *7/08*

U.S. Cl. 83—138 **15 Claims**

1. A stripper for use in a mechanical punching operation comprising means to attach the stripper to a punch, means to contact a workpiece during punching, and means to resiliently exert a force on the contacting means during punching, the resilient means being interposed between the attaching means and the contacting means, the resilient means having an axially extending cavity therein, the attaching means and contacting means having perpendicular projections cooperating with the

cavity to removably connect the stripper into an assembly, the cooperating means being selectively engageable and disengageable to allow the assembly to be selectively assembled and disassembled.



4,048,890

PUNCHING TOOL DIE

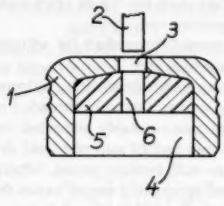
Fritz Aeschbach, Morges, Switzerland, assignor to Raskin S.A., Switzerland

Filed Nov. 4, 1976, Ser. No. 738,723

Claims priority, application Switzerland, Nov. 17, 1975, 14843/75

Int. Cl.² B26F *1/14*

U.S. Cl. 83—146 **5 Claims**



1. In a stamping or punching tool comprising a die and a punch, in which the die has a through hole for receiving the punch, said hole having a greater cross-sectional area than the punch to receive the punch with a clearance, the improvement wherein the die comprises on a side thereof opposite the side in which the punch is inserted a body of softer and more elastic material than the material of the die, said body having a through hole in extension of said through hole of die but of a lesser cross-sectional area substantially equal to that of the punch.

4,048,891

CUTTER MECHANISM FOR CUTTING SHEET MATERIAL

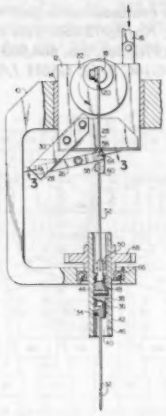
David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., East Hartford, Conn.

Filed Oct. 26, 1976, Ser. No. 735,750

Int. Cl.² D06H *7/00*; B26D *1/10*

U.S. Cl. 83—528 **8 Claims**

1. A cutter mechanism for cutting sheet material, said cutter mechanism comprising: a drive pin movable in a circular path about a given crank axis, a crossarm supported at one of its ends for pivotal movement about a crossarm pivot axis fixed relative to and parallel to said crank axis, a connecting link connected between said drive pin and the other end of said crossarm for oscillating said crossarm about said crossarm pivot axis in response to travel of said drive pin repeatedly about said circular path, a knife supported for movement along a knife axis fixed relative to said crank and pivot axes and located in a plane perpendicular to said crank and crossarm pivot axes, and an intermediate link connected between said other end of said crossarm and said knife for reciprocating said knife along said knife axis in response to oscillation of said crossarm about said crossarm pivot axis.



4,048,892

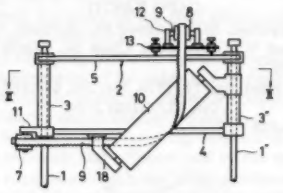
BELT SAW GUIDING DEVICE FOR A BELT SAW MACHINE

Daizo Yamashita, 3-23-11, Kaijin, Funabashi, Chiba, Japan

Filed Apr. 22, 1976, Ser. No. 679,213

Int. Cl.² B23D *55/06*; B27B *13/10*

U.S. Cl. 83—799 **1 Claim**



1. A band saw comprising in combination:

a. four upright pillars supporting a channel-shaped frame **(2)** having two pairs of sleeves slidably mounted thereon and moveable up and down with two pairs of parallel upper **(5, 6)** and lower bars **(4)** connecting each pair of sleeves, said frame defining lower and upper frame sections and front and rear ends;

b. a first set of guide pulleys **(7, 7')** rotatably mounted toward said front end of said lower frame section with a vertical axle so that said pulleys rotate in the horizontal plane;

c. a second set of guide pulleys **(8, 8')** mounted towards said rear end of said upper section with a horizontal axle so that said pulleys rotate in the vertical plane;

d. a pair of inclined parallel guide rollers **(10, 10')** held between said lower frame section and said pillars towards said rear end, an endless belt saw **(9)** extending between said first and second set of guide pulleys and turned 90° by said guide rollers; and,

e. drive means coupled to one of said pulleys to rotate said pulley and drive said band saw.

4,048,893

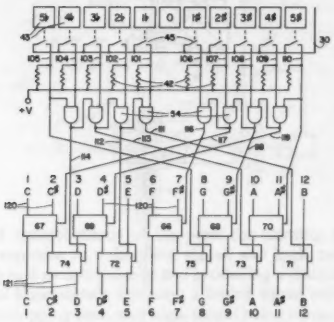
ELECTRONIC MUSICAL INSTRUMENT

Donald K. Coles, 2505 Capitol Ave., Fort Wayne, Ind. 46806

Continuation-in-part of Ser. No. 496,806, Aug. 12, 1974, Pat. No. 3,943,811, and a continuation-in-part of Ser. No. 507,118, Sept. 18, 1974, Pat. No. 3,973,460. This application Mar. 8, 1976, Ser. No. 664,903

Int. Cl.[2] G10C *3/12*; G10H *1/00, 5/06*

U.S. Cl. 84—1.01 9 Claims



1. In an electrically keyed musical instrument, tone transposition apparatus comprising:

means for generating two individual musical tones differing in pitch by a single semitone,

first and second manually operated digitals, individual digitals playing individual ones of the musical tones,

electrical switching means coupling the digitals to the tone generating means, the electrical switching means having first and second switch states, the difference between the switch states being an interchange of the tones played by the first and second digitals.

4,048,894

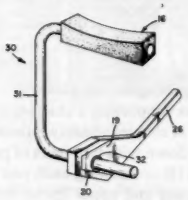
CAPO TASTO

Elliot Lee Myerson, 1815 Grismer St., Burbank, Calif. 91504, and Richard W. Gillis, 5661 Cleon St., North Hollywood, Calif. 91601

Filed Jan. 19, 1976, Ser. No. 650,147

Int. Cl.[2] G10D *3/04*

U.S. Cl. 84—318 9 Claims



1. A capo tasto for attachment to a stem of a stringed instrument, said stem having a longitudinal axis, an upper surface and a lower surface, a fret board disposed on said upper surface and a plurality of strings disposed parallel to said longitudinal axis, said capo tasto comprising:

a. a pressure bar having a length adapted to extend across said stem transversely to said longitudinal axis adjacent to said fret board;

b. mounting means for mounting said pressure bar on said stem above said strings, said mounting means including a C-shaped member having a first arm and a second arm, said pressure bar being mechanically coupled to said first arm;

c. cam means axially mounted to said second arm for rotation thereabout, said rotation being effective to apply pressure to said lower surface, said pressure being transmitted through said mounting means to said pressure bar to depress said strings; and

d. means for holding said cam means against axial movement along said second arm of said C-shaped member at such a location that said cam means is centered on said stem when said capo tasto is attached thereto.

4,048,895

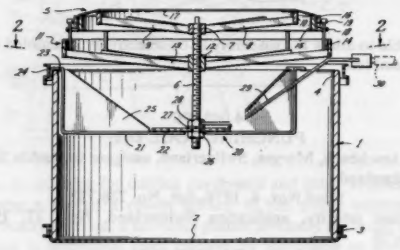
ADJUSTABLE PITCH DRUM

Randall L. May, 6027 Effingham, Houston, Tex. 77035

Filed Oct. 12, 1976, Ser. No. 731,361

Int. Cl.[2] G10D *13/02*

U.S. Cl. 84—411 A 14 Claims



13. An adjustable musical drum assembly comprising,

a cylindrical drum shell having an open end,

a threaded supporting rod,

means secured to said drum shell for adjustably supporting one end of said rod, and

drum head turning means comprising a drum head mounted on supporting means rotatably threaded on said rod and tension means non-rotatably mounted on the rod end opposite said one end of said rod, said drum head being stretched over said tension means, whereby rotation of said drum head supporting means varies the tension of the drum head and adjustment of said rod one end relative to said means secured to said drum shell varies the spacing of said drum head from said shell open end.

4,048,896

DRUM BEATER

Joseph D. Calato, 8685 Rivershore Drive, Niagara Falls, N.Y. 14304, and Joseph S. Calato, 2750 Dickersonville Road, Niagara Falls, N.Y. 14131

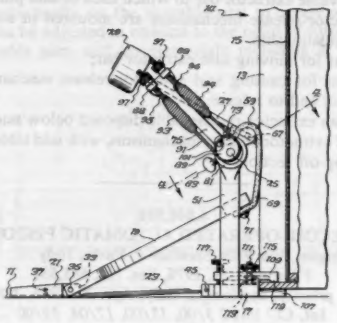
Filed Dec. 24, 1975, Ser. No. 644,419

Int. Cl.[2] G10D *13/00*

U.S. Cl. 84—422 R 9 Claims

1. A drum beater mechanism comprising: a base plate; drum clamping means carried by said base plate; a pivotally mounted treadle connected to said base plate; spaced standards mounted on said base plate, said standards mounted on said base plate, said standards extending upwardly and being provided at their upper ends with aligned bearing portions; a cam shaft rotatably mounted in said bearing portions; a rocker cam mounted on said shaft between said bearing portions for movement with said shaft; a beater stem, having a beater ball thereon, adjustably carried by said rocker cam; first flexible means connecting said treadle and said rocker cam for moving the latter to move said beater ball into contact with a drum when said treadle is depressed; tensioning means connected to said shaft for resisting rotary movement thereof, said tensioning means compris-

ing two tension springs, each opposing the other; and a pulley carried by said cam shaft for rotation therewith, said springs



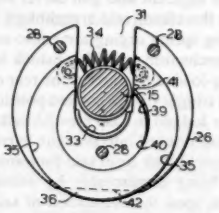
being joined by second flexible means passing around said pulley.

4,048,897

LATERALLY ENGAGABLE AND RELEASABLE NUT ASSEMBLY

Ellie Edward Price, Jr., Rte. 13, Box 166, Charlotte, N.C. 28213

Filed May 10, 1976, Ser. No. 684,486
Int. Cl.[2] F16B *37/08*
U.S. Cl. 85—33 **8 Claims**



1. In combination, a nut (26) provided with a centrally disposed threaded bore (33) and a U-shaped slot (31) extending outwardly therefrom to permit lateral insertion of the nut upon a threaded shaft (15);

a C-shaped retainer ring (36) mounted for rotation on said nut (26) in a path encircling said bore (33);

means operable in response to the rotation of said ring for selectively

confining said nut (26) and shaft (15) in relatively rotatable lateral threaded engagement with one another, and

connecting the nut and shaft for yielding lateral threaded engagement and disengagement;

said selectively operable means including a tension spring (34) bridging the gap in said C-shaped ring, the ends of said spring being detachably secured to the ends of said ring respectively, and

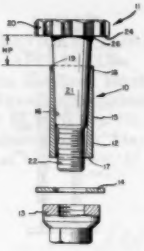
cam means (39) operable in response to the rotation of said ring for locking said nut and shaft in fixed relative position.

4,048,898

FASTENER FOR MULTI METAL STACK-UPS

Larry Salter, Lakewood, Calif., assignor to Paul R. Briles, Inglewood, Calif., a part interest

Continuation-in-part of Ser. No. 515,578, Oct. 17, 1974, abandoned. This application Sept. 29, 1976, Ser. No. 727,800
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—77 **25 Claims**



1. A pre-assembled device for use with multiple layers of material having axially aligned holes extending through the layers of material comprising,

a fastener comprising a sleeve and a fastening means,

said sleeve being circumferentially continuous and having a substantially cylindrical exterior throughout its length and a gently tapered bore through the sleeve,

said fastening means comprising a shaft with a head element at one end and clamping means at the other end,

said head element having a circumferentially continuous annular bearing area extending in a direction transverse to the axis of the shaft,

the outside of said shaft having a gentle taper varying from a size adjacent the head element end relatively larger than the initial diameter of the large end of said sleeve bore to a size adjacent the opposite end relatively smaller than said large end of the sleeve bore,

whereby there is a taper on the shaft substantially the same as the taper of said sleeve,

an auxiliary clamping means in operable engagement with the clamping means of the other end of the shaft,

said shaft having an initial pre-assembly condition with the sleeve with the sleeve slightly expanded,

said shaft having a final fastening position in the sleeve wherein the head and adjacent end of the sleeve are in pressure engagement with the material adjacent one face of the multiple layers of material and the auxiliary clamping means and sleeve end adjacent thereto are in pressure engagement with the other face of multiple layers of material at the opposite side, the tapered sleeve bore being under pressure throughout its length by the tapered exterior of the shaft,

said sleeve being in expanded condition throughout a portion of its length in an amount that overcomes the aggregate of maximum permissible tolerance of the cylindrical hole plus an amount of not less than 0.002 inches per inch providing interfering engagement outwardly with the wall of the cylindrical hole,

the exterior diameter of said sleeve reformed substantially cylindrical after being expanded,

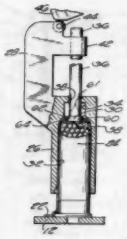
a section of the end of the sleeve adjacent the small end of the sleeve bores in initial pre-assembly condition has a reduced thickness compensating deviation in the tapered wall thickness corresponding to an adjusted wall thickness of the balance of the sleeve when in said pre-assembly condition, said reduced thickness having the same taper as said first and said sleeve, whereby the exterior of said sleeve in final expanded condition is uniformly cylindrical through its entire length of said cylindrical hole.

4,048,899

SHOTGUN SHELL CRIMPER

Theodore J. Bachhuber, and Philip C. Bachhuber, both of Mayville, Wis., assignors to Mayville Engineering Company, Inc., Mayville, Wis.

Filed July 29, 1976, Ser. No. 709,695
Int. Cl.[2] F42B *33/12*
U.S. Cl. 86—39 **3 Claims**



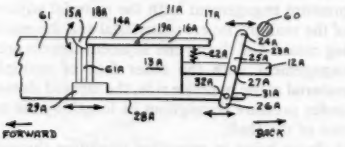
1. In a shotgun shell crimper having a crimping sleeve with a cylindrical interior cavity which is dimensioned to fit over the exterior surface of an uncrimped shotgun shell, having a rounded crimping corner on one end of said cavity, and having a crimping die movably mounted in said one end of said cavity in position to crimp the end of said shotgun shell, said crimping die having an end wall engageable with the end of a said shotgun shell and a side wall joined to the end wall, the improvement wherein said side wall is generally conical and smaller in diameter than said end wall except where said side wall and said end wall meet and the base of said generally conical shape lies on the side of said crimping die toward said shotgun shell, to permit the crimped end of the shell to overhang the crimping die to cause ironing of the crimped end of the shell against said rounded crimping corner when the crimping die is withdrawn from the crimped shell.

4,048,900

EXTRACTION ASSEMBLY

William E. Lock, 183 Wygant Road, Horseheads, N.Y. 14845, and Charles J. Churillo, 221 Gilda Place, Fort Walton Beach, Fla. 32548

Filed June 18, 1976, Ser. No. 697,663
Int. Cl.[2] F42B *39/10*
U.S. Cl. 86—48 **3 Claims**



1. An extractor-release assembly, comprising:

a. a plurality of extractor-release mechanisms, wherein each of said plurality of extractor-release mechanisms is identical and includes:

1. a support shaft;
2. a cylindrical body attached to said support shaft;
3. a plurality of finger-like grasping elements having a first end, a middle portion, and a second end, with the first end having a hook-like projection, the middle portion pivotally connected to said cylindrical body, and the second end biased to said support shaft;
4. an actuation lever having a first end, a middle portion, and a second end, with said middle portion pivotally connected to said support shaft;
5. and, at least one finger-like slide element having a first end and a second end, with said second end pivotally connected to said first end of said actuation lever, and with said finger-like slide element abutting with and slidably movable along said cylindrical body;

b. a movable extractor bar to which each of said plurality of extractor-release mechanisms are mounted in a side-by-side relationship;

c. means for moving said extractor bar;

d. means for causing said extractor-release mechanisms to extract and to release;

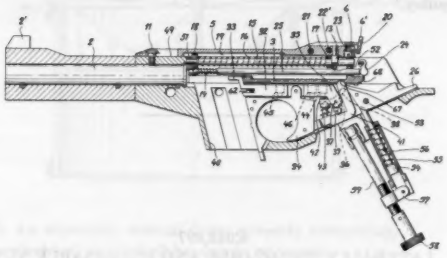
e. and, an extractor-release table disposed below said plurality of extractor-release mechanisms, with said table having a drop-off section.

4,048,901

RECOIL-OPERATED AUTOMATIC PISTOL

Emilio Ghisoni, Via Villa Serafina 4, Pavia, Italy

Filed Apr. 29, 1976, Ser. No. 681,589
Claims priority, application Italy, Apr. 29, 1975, 22834/75
Int. Cl.[2] F41C *3/00, 15/00, 17/04, 19/00*
U.S. Cl. 89—132 **19 Claims**



1. An automatic pistol comprising:

a gunstock with a gun barrel adapted to receive a succession of cartridges from a magazine, said gunstock forming a track to the rear of said gun barrel;

a breechblock slidable along said track between a forward position adjacent said gun barrel and a retracted position remote therefrom, said breechblock being provided with a restoring spring urging same into said forward position;

a firing mechanism on said gunstock including a trigger and a spring-loaded hammer at the rear of said track releasable by said trigger from a cocked position to strike a firing pin slidably lodged in said breechblock for detonating a cartridge introduced into said gun barrel upon a retraction of said breechblock from said forward position, said breechblock being displaceable by recoil into said retracted position upon the detonation of said cartridge and being engageable with said hammer upon such displacement to recock said hammer preparatorily to another detonation;

a pair of upstanding wings rigid with said gunstock flanking a rear portion of said track and bracketing said breechblock therebetween, said wings having front edges forming an abutment engageable with an enlarged front part of said breechblock in said retracted position thereof; and

a retaining member detachably secured to said gunstock at said wings and at an elevated land adjacent said gun barrel for guiding said breechblock along said track.

4,048,902

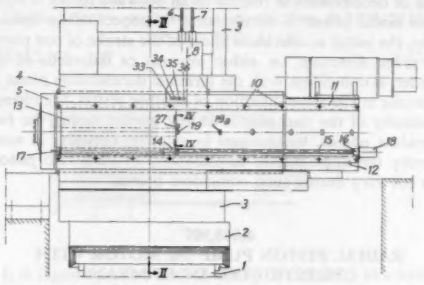
BALANCING AND COMPENSATING ARRANGEMENT

René Deflandre, 6 rue Alfred Dehodencq, 75016 Paris, France

Filed Jan. 20, 1975, Ser. No. 542,496
Claims priority, application France, Jan. 31, 1974, 74.03270
Int. Cl.[2] B23Q *5/22*; B23C *1/027*
U.S. Cl. 90—11 F **6 Claims**

1. An arrangement for balancing and compensating for the overhang effect caused by longitudinal moment of a movable

part of a machine along a supporting table, in which the said movable part is suspended at a point situated substantially on a vertical line passing through its center of gravity, wherein the movable part is provided with a counterweight which is movable longitudinally on the movable part to create a moment which can be adjusted in relation to the point of suspension of the movable part; said counterweight including at least one



actuator selectively acting on electric contact members fixed to the movable part, said contact members being positioned as a function of the tipping moment of an accessory mounted on the movable part; and means for moving the counterweight along said movable part, said contact members controlling the moving means to stop the displacement of the counterweight by the moving means when the contact members are engaged by the actuator.

4,048,903

ROTARY HYDRAULIC MACHINE HAVING A VALVE RESPONSIVE TO ROTOR BORE PRESSURE AND STATOR PORT PRESSURE

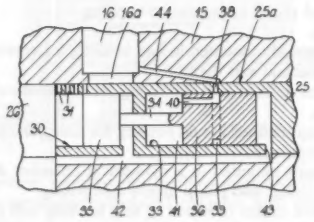
Thomas Ernest Edwin Roberts, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 15, 1976, Ser. No. 667,042

Claims priority, application United Kingdom, Apr. 24, 1975, 16957/75

Int. Cl.[2] F01B *3/00, 13/04*

U.S. Cl. 91—6.5 **8 Claims**



1. A rotary hydraulic machine comprising a housing, a rotor within the housing, said rotor having a plurality of bores which open onto a face of the rotor, means, responsive to rotation of the rotor, for causing liquid displacement within said bores to accompany said rotation, a port plate against one face of which said rotor face is engaged, said port plate including a first port with which said bores can successively communicate, a first passage in said port plate, said first passage communicating with said first port and with port means which open on to said port plate face, said port means being spaced from said first port, in a direction of the path of movement of said bores across said port plate face, so that said bores communicate, in use, with said port means before communicating with said first port, said port means extending in said direction of movement, and a control element, responsive to an increase in pressure in said bores, for progressively uncovering said port means in a direction away from said first port, and to an increase in pressure in said first port for progressively covering said port means in a direction towards said first port.

4,048,904

SERVO VALVE DEVICE IN POWER STEERING APPARATUS

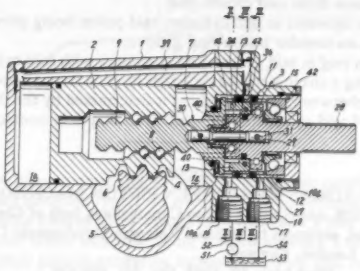
Minoru Kawabata, Chita, and Kenji Takahashi, Kariya, both of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Japan

Filed May 11, 1976, Ser. No. 685,259

Claims priority, application Japan, May 30, 1975, 50-65709

Int. Cl.[2] F15B *9/10*

U.S. Cl. 91—375 A **6 Claims**



1. In a power steering apparatus having a fluid pressure motor supplementing manual steering torque, a first rotatable steering rod member rotating in response to the action of said fluid pressure motor, a manually rotatable second steering rod member aligned with said first steering rod member, and a servo valve device serving to distribute fluid under pressure to said fluid pressure motor in response to rotational phase difference between said first steering rod member and said second steering rod member due to manual steering torque, said servo valve device comprising:

a main valve member mounted on one of said two steering rod members nd having an axial slot extending from one open axial end thereof toward a closed axial end in a plane containing a rotational axis thereof;

partition means housed in said axial slot and separably fixed to said main valve member for fluid-tightly partitioning said axial slot into at least two axially spaced slots so as to respectively define a first valve chamber and a second valve chamber being axially spaced apart, said first valve chamber being connected to a fluid supply line and being provided with a pair of distribution ports, one of which communicates with one of the operative ports of said fluid pressure motor and the other of which communicates with the other of said operative ports of said fluid pressure motor, said second valve chamber being connected to a fluid exhaust line and being provided with a pair of injection ports, one of which communicates with said one of said distribution ports and the other of which communicates with said other of said distribution ports;

a radially extending first flap valve member mounted on the other of said two steering rod members and located in said first valve chamber for controlling flow of said fluid being supplied under pressure to said two distribution ports; and

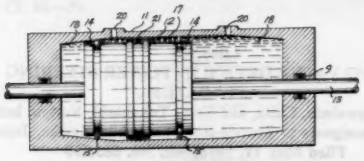
a radially extending second flap valve member integrally formed with said first flap valve member and located in said second valve chamber for controlling flow of said fluid under pressure from said two injection ports.

4,048,905

VARIABLE ORIFICE HYDRAULIC SNUBBER

Richard Ervin Souslin, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 29, 1976, Ser. No. 671,633
Int. Cl.[2] F15B 15/22; F01B 11/02
U.S. Cl. 91—405 2 Claims



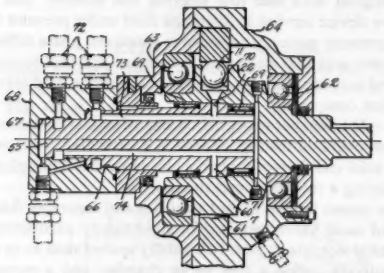
1. A piston and cylinder assembly comprising:
a cylinder having a closed end, the internal diameter of said cylinder increasing, over a portion of the length, with distance from said closed end;
a piston movable in said cylinder, said piston being provided with an annular piston-ring groove;
a piston ring in said groove and in contact with said cylinder having a circumference such that its ends form an opening therebetween, which opening is determined by the diameter of said cylinder with which the ring is in contact.

4,048,906

LOW-STRESS CAM-DRIVEN PISTON MACHINES

Donald Firth, and Sinclair Upton Cunningham, both of Glasgow, Scotland, assignors to National Research Development Corporation, London, England

Filed Mar. 19, 1969, Ser. No. 808,536
Claims priority, application United Kingdom, Mar. 22, 1968, 14082/68
Int. Cl.[2] F01B 13/06
U.S. Cl. 91—491 7 Claims



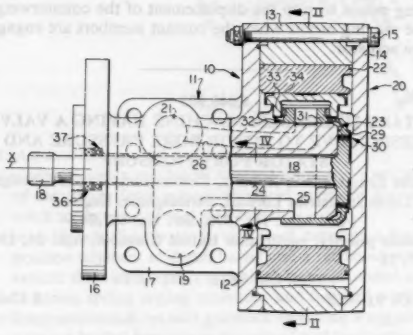
1. A hydrostatic piston-and-cylinder machine having an array of cylinders and a piston for, and movable in, each such cylinder, a sinuous cam track, and cam-following surfaces of or carried by the pistons engaging the cam track whereby the pistons move to and fro along the axes of their cylinders on movement of the cylinder array along the length of the cam track characterized in that the cam track is so shaped as to impose on the piston for an outward stroke of said piston, commencing with the associated cam follower surface engaging the center of a crest of the cam, an initial phase of acceleration starting at a relatively low rate of velocity change and during which the magnitude of the function of piston velocity plotted against time rises concavely, and a terminal phase of deceleration concluding with a relatively high rate of velocity change and during which the magnitude of the said piston velocity function falls convexly and further characterized in that each inward stroke of a piston, terminating with the associated cam follower surface engaging the center of a crest of the cam, has an initial phase of acceleration for said piston starting at a relatively high rate of change of velocity in which the magnitude of the said piston velocity function value rises convexly and a terminal phase of deceleration concluding with a relatively low rate of change of velocity, and in which the magnitude of the said piston velocity function value falls concavely and in which the initial phase of acceleration in respect of an outward stroke is equal in duration to the terminal phase of deceleration in respect of an inward stroke and the terminal phase of deceleration in respect of an outward stroke is equal to the initial phase of acceleration in respect of an inward stroke, the initial acceleration phase of the stroke of one piston in a given direction, i.e. either inwards or outwards of the cylinder, is coincident with the terminal deceleration phase of the stroke in the same direction of another piston, the change of velocity of the two pistons at any instant during the two coincident phases, being equal in rate but opposite in sense whereby the aggregate of displacement of such two pistons does not vary during such coincident phases.

4,048,907

RADIAL PISTON PUMP OR MOTOR WITH UNRESTRICTED INLET MEANS

William K. Engel, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 8, 1975, Ser. No. 638,582
Int. Cl.[2] F01B 13/06
U.S. Cl. 91—492 10 Claims



1. A radial piston apparatus comprising
a housing,
a shaft rotatably mounted in said housing for rotation about a longitudinal axis thereof,
inlet means defined in said housing for communicating fluid therein,
outlet means defined in said housing for communicating fluid therefrom, and
pump means mounted in a cylindrical chamber defined in said housing, said pump means comprising
pintle valve means mounted in said housing and defining a single inlet chamber therein,
a rotor operatively connected to said shaft for rotation therewith and rotatably mounted on said pintle valve means in eccentric relationship relative to said cylindrical chamber,
a plurality of circumferentially spaced and hollow piston means mounted on said rotor to extend radially outwardly therefrom,
a cylinder means mounted on an end of each of said piston means for relative reciprocal movement therebetween and disposed in sliding bearing contact internally of said cylindrical chamber,
first passage means, having said shaft disposed therein constituting a single and substantially unrestricted passage defined in said housing and extending from said inlet means to said single inlet chamber, and
second passage means defined in said housing for communi-

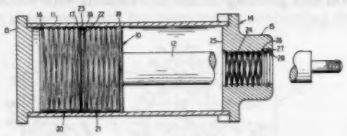
cating an outlet side of said pintle valve means with said outlet means.

4,048,908

PISTONS

William James Urquhart, Tumbi Umbi, Australia, assignor to F. B. J. Engineering Services Pty. Limited, Granville, Australia

Filed Dec. 9, 1975, Ser. No. 639,045
Claims priority, application Australia, Dec. 9, 1974, 76169/74
Int. Cl.² F01B *31/10*
U.S. Cl. 92—159 **4 Claims**



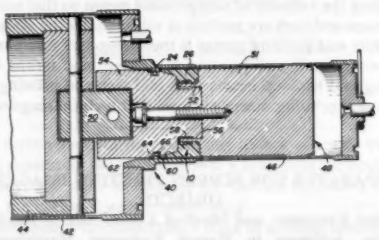
1. A liquid operated double-acting device, such as a hydraulic ram comprising: a cylinder with a bore, a piston reciprocable in said bore, said piston having at least one circumferentially complete sealing means arranged around the circumference thereof in slidable sealing relationship with said bore, left and right hand intersecting helical channels formed on the surface of said piston between each end of said piston and said sealing means, each of said channels terminating in a circumferential groove at each end of said piston.

4,048,909

PISTON RING

Robert E. Jepsen, Emmaus, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 302,932, Nov. 1, 1972, Pat. No. 3,999,768. This application Aug. 5, 1976, Ser. No. 711,945
Int. Cl.² F16J *1/06*
U.S. Cl. 92—194 **5 Claims**



1. A piston assembly for reciprocation inside a cylinder having a generally cylindrical cylinder wall comprising in combination:

a first piston section substantially cylindrical in shape having a top and bottom planar surface with a thin walled, open ended cylindrical adaptor defining an internal chamber fixed to one planar surface of the first section, said wall of said adaptor constructed to deflect elastically under circumferential loads;

a second piston section having means to secure it to the first section and having a first generally cylindrical portion having a diameter smaller than the thin walled adaptor of said first section and a second portion substantially cylindrical in shape and substantially identical in diameter with the first piston section and an annular projection on said first portion adapted to engage said thin walled adaptor within said chamber adjacent said one planar surface to axially align aid first and second piston sections whereby said thin walled adaptor can deflect toward the smaller diameter portion of said first cylindrical portion; and

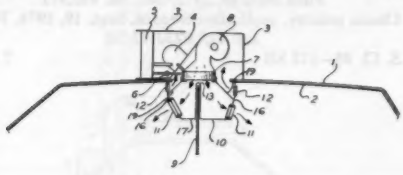
a piston ring between said first and second piston sections, said ring sealingly engaging the outside surface of the thin walled adaptor of said first piston section and adapted to engage a cylinder wall in sealing engagement so that fluid leakage between said ring and a cylinder wall and said ring and said piston is prevented.

4,048,910

PLENUM COVER FOR ROOF MOUNTED VEHICLE AIR CONDITIONER

Robert Weir, 277 Bronx River Road, Yonkers, N.Y. 10704

Continuation-in-part of Ser. No. 633,667, Nov. 20, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 735,051
Int. Cl.² B60H *1/28*
U.S. Cl. 98—2.16 **1 Claim**



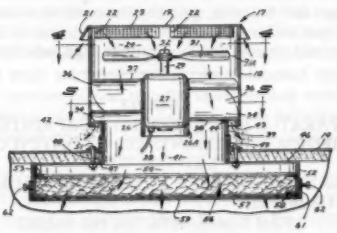
1. A plenum cover for use with a vehicle air conditioner of the roof mounted type, said cover having an opening at its top and being formed by elongated side walls and a base joined to said side walls, said base being formed defining a continuous elongated groove extending upwardly toward said opening at the top and spaced between said side walls being adapted to receive a partition said vehicle, a plurality of air flow diffusers being located in said cover on opposite side of said elongated groove, said side walls having a plurality of openings for admitting return air into said cover, and a plurality of flow vanes positioned in said cover and being adapted to separate cool air flow being discharged through said diffusers from return air flow entering through said openings in said side walls.

4,048,911

AIR SUPPLY APPARATUS

Ross K. Petersen, 5211 Lakeland Ave., Minneapolis, Minn. 55429

Filed July 29, 1976, Ser. No. 709,551
Int. Cl.² F24F *7/00*
U.S. Cl. 98—39 **20 Claims**



1. An apparatus for supplying air to a location comprising: a casing surrounding a chamber, said casing having a first end, a second end, and at least one air inlet opening open to the chamber to allow outside air to flow into the chamber; means for covering the first end of the casing, a plurality of stationary inclined vanes located in the chamber secured to the casing, adjacent vanes being spaced from each other to form passages open to the chamber and the second end of said casing, a rotatable fan located in the chamber between the vanes and

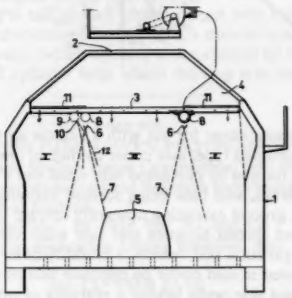
means for covering the first end of the casing, motor means for rotating said fan whereby air is moved through the air inlet opening into the chamber and through the chamber in a circular path thereby concentrating particulates in an outer zone of air moving through the chamber and passages, means mounting the motor means in the central portion of the chamber, and a collar located adjacent the second end of the casing providing a clean air outlet passage and an air discharge opening, said outer zone of air and particulates being discharged through said air discharge opening and the remaining air being discharged through the clean air outlet passage.

4,048,912

COLOR SPRAY BOOTH AND METHOD OF VENTILATING THE SAME

George Walker, Staines, England, assignor to AB Svenska Flaktfabriken, Nacka, Sweden

Filed Sept. 19, 1975, Ser. No. 615,971
Claims priority, application Sweden, Sept. 19, 1974, 7411766
Int. Cl.[2] F23J *11/00*
U.S. Cl. 98—115 SB **7 Claims**



1. In a process for ventilating a station for the surface treatment of spaced-apart successive objects arriving sequentially at said station, by passing inlet ventilating air downward through said station and about said objects from inlets in a ceiling above said station, removing said ventilating air by way of outlets in a floor below the level of the objects, and dividing the interior of said station into a first zone adjacent each said successive object and at least a pair of other zones more remote from said each object by means of a pair of curtains of air moving at a velocity higher than that of said ventilating air and disposed generally adjacent opposite sides of said object, the improvement wherein said curtains are directed convergently downward so that said flow of said ventilating air in said first zone converges downwardly, whereby the outflow of said ventilating air from said one zone is principally by way of the spacing between said objects and at relatively high velocity.

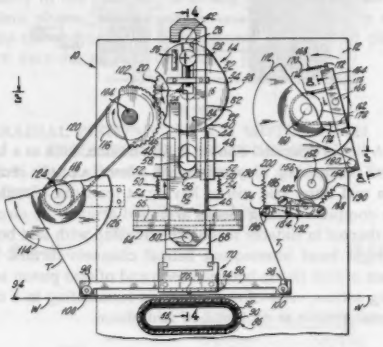
4,048,913

APPARATUS FOR REPETITIVE IMPRINTING AT UNIFORM INCREMENTS ON A CONTINUOUSLY MOVING WEB

Menashe Navi, Elizabeth, N.J., assignor to Adolph Gottscho, Inc., Union, N.J.

Filed Sept. 6, 1974, Ser. No. 503,882
Int. Cl.[2] B41F *1/04*
U.S. Cl. 101—27 **39 Claims**

1. A printing apparatus for webs continuously moving along a first path comprising printing means positioned on one side of the path; back-up means on the other side of said path facing said printing means; means for cyclically displacing said printing means along a second path having a first portion extending substantially along said first path and a second portion spaced from said first path, said printing means engaging said web against said back-up means while in said first portion of said second path to effect printing, said means for displacing said printing means including a first displacing means for displacing the printing means toward and away from said web and a second displacing means for displacing the printing means substantially parallel to said first path, said first displacing means being operatively coupled to said second displacing means for the coordinate operation thereof, said second displacing means including a wheel continuously rotating about its axis, a displaceable pivot means mounted on said wheel at a location radially spaced from said wheel axis, a fixed pivot means positioned intermediate said wheel axis and said printing means, and means coupling said displaceable pivot means and said printing means, said coupling means being pivotally mounted on said printing means and formed with a slot means



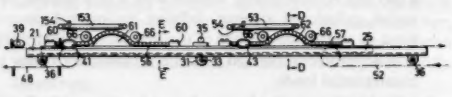
for receiving said displaceable and fixed pivot means to permit pivotable and lateral displacement of said coupling means relative to said displaceable and fixed print means, said coupling means pivoting about said fixed pivot means in response to the rotatable displacement of said displaceable pivot means on said wheel to reciprocally displace said printing means in a direction substantially parallel to said first path, said means for displacing said printing means including means for selectively adjusting the velocity of said printing means so that said printing means and web are moving at substantially the same velocity while said printing means is traversing said first portion of said second path and printing is effected; and means for displacing said back-up means with said web and printing means when said printing means engages said web thereagainst.

4,048,914

APPARATUS FOR SCREEN PRINTING IMAGES ON OBJECTS

Wilfried Kammann, and Manfred Keller, both of Bunde, Germany, assignors to Werner Kammann Maschinenfabrik, Bunde, Germany

Filed Oct. 23, 1975, Ser. No. 625,348
Claims priority, application Germany, July 8, 1975, 2530360
Int. Cl.[2] B41F *17/20*
U.S. Cl. 101—35 **29 Claims**



1. An apparatus for printing images on objects, comprising at least one printing stencil; at least one doctor associated with said stencil; means for moving said stencil and doctor relative to one another; means for transporting the objects in a predetermined path and direction past said stencil, including a carrier extending along said path and mounted for reciprocation in said direction and opposite thereto by a given distance and at least two pairs of support members connected to said carrier

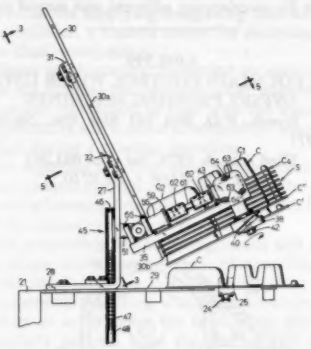
to share the reciprocatory movement thereof and being spaced from one another by said distance, each of said pairs having a common axis transverse to said path and being operative for coaxially supporting a respective object, said carrier including at least one carrier component which is flexible in a plane extending parallel to said direction and substantially normal to said stencil, said support members being mounted on said flexible carrier component; means for flexing said carrier component in said plane and including a guide member in engagement with said carrier component and having a configuration which is dependent on the shape of the object transported thereby, and a plurality of rollers engaging said carrier component opposite said guide member; and at least one intermediate support along said path for temporarily supporting the objects.

4,048,915

METHOD AND APPARATUS FOR DENESTING CARTONS

Thomas R. Martin, Milwaukee, Wis., assignor to Condes Corporation, Milwaukee, Wis.

Filed Apr. 7, 1976, Ser. No. 674,541
Int. Cl.[2] B65H *3/28*; B65G *59/10*
U.S. Cl. 101—35 **7 Claims**



1. A carton denester for supporting a stack of nested cartons and for separating the cartons one at a time from the bottom of said stack, and wherein each of the cartons includes a lateral flange, the carton denester comprising:

support means for supporting a stack of cartons, said support means being inclined to vertical for at least partially supporting the weight of the stack of cartons thereon, the stack of cartons being downwardly movable along the support means as the cartons are separated from the bottom of the stack and said support means including a lower edge;

rotatable feed screw means for separating the bottom carton from said stack of cartons, and being supported generally below said stack of cartons with respect to the direction of movement of said cartons along said support means, said screw means having an upper surface coplanar with said lower edge of said support means for partially supporting the said stack of cartons, said screw means also having a helical groove intersecting said upper surface for receiving the flange of the bottom carton of the stack when the flange of the bottom carton has moved below said lower edge, to thereby separate the bottom carton from the stack when the feed screw means rotate; and

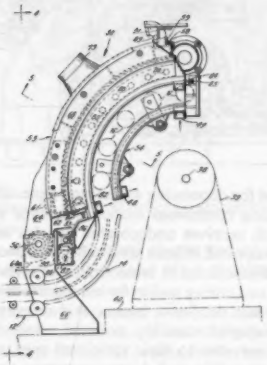
means for rotating the feed screw means.

4,048,916

CURING SECTION FOR CONTINUOUS MOTION DECORATOR

Stanley Silverman, Denville, and John Broells, Wyckoff, both of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Sept. 26, 1975, Ser. No. 617,006
Int. Cl.[2] B41F *17/20*; F26B *3/30*
U.S. Cl. 101—40 **8 Claims**



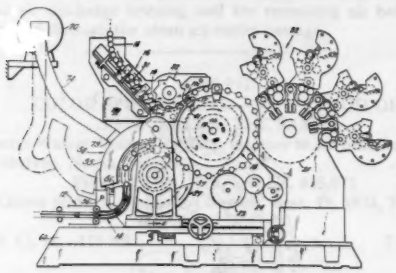
1. Apparatus for decorating and curing generally cylindrical articles including continuously moving conveyor means having an input which receives undecorated articles and an output from which decorated articles are discharged, decorator means for applying decorations to undecorated articles on said conveyor means, and curing means for curing decorations applied to articles by said decorator means; said conveyor means including a plurality of rotatably mounted mandrels which carry articles while said decorator means applies decorations thereto; said conveyor means also including a transfer assembly including a plurality of heads which receive decorated articles directly from said mandrels and hold these articles while decorations thereon are being cured by said curing means; said transfer assembly being mounted for continuous rotation about a main axis; each of said heads holding a cylindrical article with its cylindrical axis extending generally parallel to said main axis; said curing means disposed adjacent a peripheral portion of said transfer assembly and outboard of articles held by said heads; said curing means including a plurality of sources emitting radiation for rapidly curing decorations, said plurality of sources being in an arcuate array and said peripheral portion of said transfer assembly extending upstream from said output of said conveyor means; each of said sources including an elongated lamp having it longitudinal axis positioned generally parallel to said main axis; said arcuate array being part of a subassembly that is mounted for movement between an operating position adjacent to said spindles and a service position remote from said spindles and wherein said lamps are accessible for removal and replacement; a pivot means at the downstream end of said subassembly about which the latter is moved between its said operating and said service positions; said downstream end being below the upstream end of said subassembly in the vicinity of the output of said conveyor means.

4,048,917

CONTINUOUS MOTION PRINTING APPARATUS

John P. Skrypek, Mahwah, and Arnold Peters, West Paterson, both of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Sept. 26, 1975, Ser. No. 617,007
Int. Cl.[2] B41F 17/20; H01J 37/00
U.S. Cl. 101—40 6 Claims



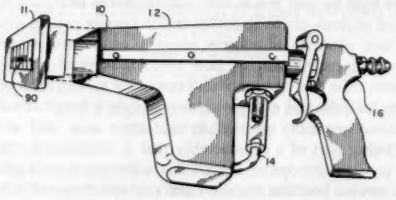
1. Apparatus for decorating and curing generally cylindrical articles including continuous motion conveyor means having an input which receives undecorated articles and an output from which decorated articles are discharged, decorator means for applying decorations to undecorated articles on said conveyor means, and curing means for curing decorations applied to articles by said decorator means; said conveyor means including a plurality of rotatably mounted mandrels in continuous motion transverse to their rotational axes, said mandrels carrying articles while said decorator means applies decorations thereto; said conveyor means also including a transfer assembly including a continuously rotating wheel mounting a plurality of heads which receive decorated articles directly from said mandrels and hold these articles while decorations thereon are being cured by said curing means, each of said heads including a spindle having an axis substantially coincident with the axis of an article carried thereby; and means for rotating both said spindle and an article thereon about their axes while an article on the spindle is having its decorations cured by said curing means, said means for rotating said spindle and an article thereon being inactive to rotate said spindle while an article is being received by said spindle from said mandrel.

4,048,918

STENCILING APPARATUS AND IDENTIFICATION SYSTEM

Gregory George Alexander Peck, Brisbane, Australia, assignor to Identicar Corporation of America, Watertown, Mass.

Filed Nov. 6, 1975, Ser. No. 629,650
Claims priority, application Australia, Aug. 13, 1975, 2784/75
Int. Cl.[2] B41F 15/36
U.S. Cl. 101—114 5 Claims



5. A stenciling apparatus of the type having a pistol-type compressed air supply member for stenciling medium delivery means comprising:

a hollow casing having a rear end portion receiving said air supply member, a front end portion defining a rectangular aperture and a lower stenciling medium and recycling area, said front and lower casing portions being interposed by means of a sloping curvature casing portion;

a stencil holding unit, having a circumscribed interior rectangular aperture smaller than said casing aperture positioned within and over said casing aperture;

means about said stencil holding unit aperture for forming two parallel retaining grooves of two resilient converging lips for each of said grooves and for forming two retaining groove slots by means of overlapping flanges, said slots perpendicularly abutting said retaining grooves;

a plurality of rectangular body unit stenciling indicia members having triangularly shaped end members, perpendicularly affixed along the stencil body width, capable of being engageable within said retaining groove converging lips;

at least two rectangular body end unit stencil indicia members having said triangularly shaped end members for insertion into said retaining groove and having a protruding flange member, abutting the length of the body of one side of said stencil member, capable of being engageable within said retaining slot and flange;

each of said unit stencils having a protruding triangular flange extending from one corresponding side of each of said triangular end members and having a complimentary mating triangular indentation upon the opposing side of each of said triangular end members for interlocking adjacent unit stencil members; and

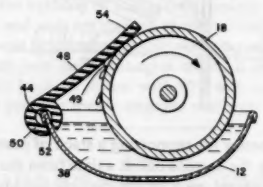
each of said unit stencils having a protruding flange extending the length of one edge of the body of said unit stencil member for overlapping adjacent unit stencil members.

4,048,919

WATER FOUNTAIN CONTROL WIPER UNIT FOR OFFSET PRINTING MACHINES

Kenneth D. Woods, P.O. Box 141 Star Rte., Spring Valley, Calif. 92077

Filed Aug. 4, 1975, Ser. No. 601,362
Int. Cl.[2] B41F 7/26, 9/10
U.S. Cl. 101—148 7 Claims



1. A water fountain control wiper unit for mounting on the edge of a fountain tray in offset printing machines for controlling the amount of water on selective portions of the water fountain roller comprising:

a wiper blade and connector means unitarily constructed on a common resilient material,

said wiper blade having a given length defined by that dimension extending parallel to the axis of a roller with which said blade cooperates and a width sufficient to extend from the edge of the water fountain tray to a point beyond the adjacent trangentially aligned surface of the water fountain roller,

said wiper blade having a flat surface for engagement with the surface of a water fountain roller,

said connector means includes a slit tubular portion extending at least partially along the length of said blade defining resilient gripper means for securing the wiper blade to the edge of the water fountain tray,

said gripper means and said blade defining biasing means for resiliently biasing the flat surface of the wiper blade for resiliently contacting tangentially against the surface of

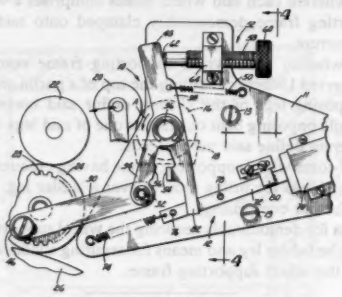
the water fountain roller for removing water therefrom upon rotation of the water fountain roller.

4,048,920

MOISTURE SYSTEM CONTROL APPARATUS

Gerhard A. Nothmann, Wilmette, Ill., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Aug. 2, 1976, Ser. No. 710,401
Int. Cl.² B41F 7/26
U.S. Cl. 101—148 **10 Claims**



1. In a lithographic duplicating machine having a main power source, a master cylinder and fountain means including a fountain roller for supplying dampening fluid to a master on the master cylinder, a control means for metering the rate of feed of the fluid, comprising:

drive means mechanically connected to said main power source for rotating the fountain roller unidirectionally in intermittent increments in time with the master cylinder and operable in a first mode to control the feed of dampening fluid during a printing operation;

means for adjusting the drive means to set the magnitude of the incremental motions of the fountain roller to a desired value by infinitesimal degrees, with respect to operation of the drive means in said first mode; and

means for overriding the adjusting means and shifting the drive means into a second mode of operation which rotates the fountain roller in substantially shorter intermittent increments than those which characterize the printing operation so as to meter the feed of the fluid at a rate substantially reduced from the rate of feed of the fluid obtaining during the first mode and for maintaining the drive means in said second mode during non-printing operation while the machine is idling, and also for shifting the drive means from the second mode into the first mode and maintaining the same in said first mode during a printing operation.

4,048,921

ELECTROSTATIC PRINTING/DUPLICATING METHOD USING POLARIZATION FORCES

Curt R. Raschke, Somerset, N.J., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 447,170, March 1, 1974, abandoned. This application Sept. 18, 1975, Ser. No. 614,502
Int. Cl.² B41M 1/22
U.S. Cl. 101—426 **2 Claims**

1. The process of producing copies of an original document on plain paper, comprising the steps:

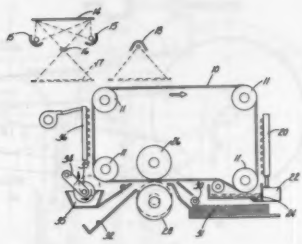
a. providing a carrier comprising a conductive sheet with a dielectric surface;

b. establishing an electrostatic charge pattern on the surface of said dielectric surface;

c. providing substantially uncharged toner particles of material in a size range of 5 to 25 microns and a dielectric constant of about 8 or higher, and

bringing a plurality of the selected particles into contact with said charge pattern, to polarize and attract said particles to the charge pattern, without discharging said pattern, and therefore hold said particles with polarization forces of a low first order of magnitude;

d. placing said dielectric surface after being toned, into contact with a sheet of plain paper under pressure to establish mechanical adhesion forces between said paper and toner particles with a second order of magnitude



greater than the said first order produced by said polarization forces;

e. retoning the undischarged charge pattern and repeating the process of steps (c) and (d) a plurality of cycles to produce multiple copies; and

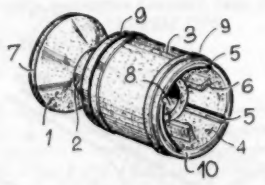
f. removing residual toner and the electrostatic charge from said dielectric surface at the end of the production of a predetermined number of copies, rendering said dielectric surface capable of receiving a new image.

4,048,922

SELF-FRAGMENTABLE BULLET

Stephan Buljovcic, Versailles, France, assignor to Rene Cosson S.A., Paris, France

Filed June 2, 1976, Ser. No. 692,215
Claims priority, application France, June 3, 1975, 75.17308
Int. Cl.² F42B 11/18
U.S. Cl. 102—92.7 **10 Claims**



1. A self-fragmented bullet comprising a block containing a central core, a peripheral part surrounding said core, said peripheral part comprising a plurality of panels extending longitudinally and separated by weakened areas which also extend longitudinally, and passageways between said peripheral part and said core extending from end to end of said block.

4,048,923

RETURN LOOP FOR TRANSPORT VEHICLES

Francois Louis Giraud, Plaisir, France, assignor to Savec, Maurepas, France

Filed Mar. 31, 1976, Ser. No. 672,129
Claims priority, application France, Apr. 3, 1975, 75.10440
Int. Cl.² B61J 1/12; B61K 1/00
U.S. Cl. 104—21 **4 Claims**

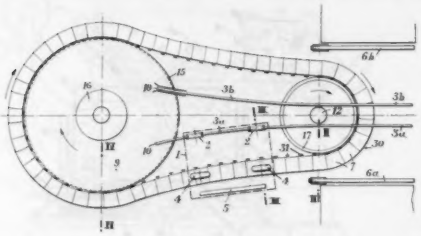
1. In a transport system comprising at least one vehicle, a

device for returning this vehicle at a line terminal, which comprises in combination:

a conveyor forming a closed, partly circular loop at said terminal;

a rotary platform having a substantially circular marginal portion, which is partly encircled by said conveyor;

at least one lead-rail leading to said terminal and one return rail, both rails terminating with a bevelled portion in the vicinity of said platform marginal portion;



conveyor engaging means carried by said vehicle to enable said vehicle to bear on said conveyor during the returning operation, and

at least two wheels also carried by said vehicle and also adapted to constitute bearing member therefor, said wheels comprising each a first bearing surface located in a first plane and enabling said wheels to roll on said rails, and a second bearing surface located in a plane other than said first plane and enabling said wheels, after they leave said lead-rail and before they engage said return rail, to roll and slide on said platform.

4,048,924

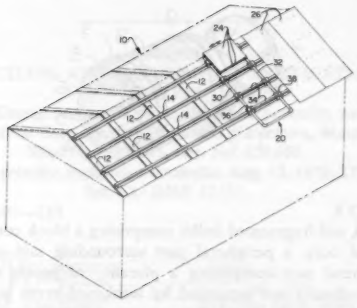
ROOFING SYSTEM

Warren G. Wibben, 479 N. State St., Apt. B-1, Concord, N.H. 03301

Continuation-in-part of Ser. No. 542,121, Jan. 20, 1975, abandoned. This application Jan. 12, 1976, Ser. No. 648,529

Int. Cl.[2] E04E *3/02;* **E04D** *15/07*

U.S. Cl. 104—245 **2 Claims**



1. Roofing apparatus for handling roofing panels over purlins having tops and top free edges running the length of a pitched roof for supporting the lengths of panels in a slope direction of roof pitch comprising,

means defining a carriage structure with an elongated skeletal frame extending orthogonal to the purlins and spaced wheel means riding on each of several adjacent purlins and carrying the skeletal frame,

the carriage structure extending over a length of at least half the length of the roofing panels to be emplaced,

each of the wheel means comprising at least first and second wheels with said first wheel having an essentially horizontal axis and said second wheel having an essentially vertical axis,

the first wheel riding on top of a purlin and the vertical axis second wheel being arranged to bear against the top free edge of a purlin, at least one such wheel wheel being provided for each of several adjacent purlins of the roofing,

and wherein the carriage structure is of ladder form and comprises at least two of said wheel means at each rung of the ladder,

and wherein each said wheel means comprises a wheel supporting frame demountably clamped onto said carriage structure,

and wherein each wheel supporting frame comprises an inverted U-form straddling the top of a purlin and holes in opposing legs of the U-form define said horizontal axis while opposing bent out ears in one of said legs with holes therein define said vertical axis,

the U-form wheel supporting frame having cutouts in opposing U-legs for fitting closely over a ladder leg,

and further comprising,

means for demountably securing the wheel supporting frame to the ladder leg and means for securing a ladder rung end to the wheel supporting frame.

4,048,925

VEHICLE FOR AND METHOD OF OPERATION ON BOTH ROAD AND RAILROAD TRACK

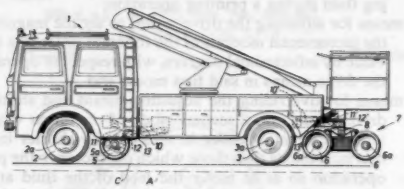
Anders Georg Storm, Solna, Sweden, assignor to Swedish Rail System AB SRS, Solna, Sweden

Filed June 10, 1976, Ser. No. 694,634

Claims priority, application Sweden, June 11, 1975, 7506711

Int. Cl.[2] B61F *13/00*

U.S. Cl. 105—215 C **6 Claims**



1. A vehicle for operation on both road and railroad track, provided with a wheeled chassis which enables the vehicle to transfer between a road and a railroad track that are substantially perpendicular to each other comprising a steered front rubber tire wheel axle and a rear rubber tire wheel axle, and at least one front and rear rail wheel axle provided with rail wheels, each rear rail wheel axle pivoting around a vertical axis relative to the wheel chassis, said rail wheel axle being vertically displaced by drive means into engagement with the railroad track during the lifting of adjacent rubber tire wheels out of engagement with the road wherein the rear rail wheel axle is located behind the rear wheel axle for rubber tire wheels of the vehicle and pivots at least 180° around the vertical axis.

5. A method of turning around a vehicle having rail wheels on axles positioned behind a front steered and a rear road wheel axle carrying rubber tire wheels, respectively, on a railroad track, comprising the steps of at the turning around movement keeping the rail wheels for the rear wheel axle or axles which pivots about a vertical axis on the track while supporting the forward portion of the vehicle on the rubber tire wheels on the steered axle, moving off the road by having rubber tire wheels at a position where the vehicle forms an angle of about 90° with the track, thereafter moving the vehicle with the rear rail wheel axle on the track to a position in parallel with the track, so that the vehicle is turned into the

opposite direction relative to the starting position, and engaging the rail wheels on the front rail wheel axle with the track.

4,048,926

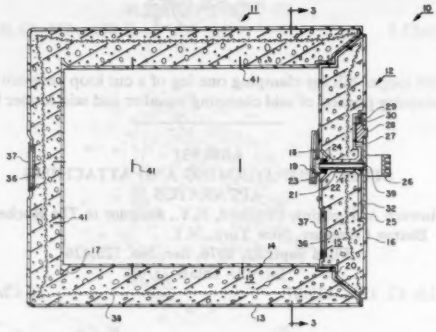
SAFE

John D. Brush, Jr., and George M. Burgess, both of Webster, N.Y., assignors to John D. Brush & Co., Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 588,967, June 20, 1975. This application Jan. 12, 1976, Ser. No. 648,504

Int. Cl.[2] E05G *1/026*

U.S. Cl. 109—65 **16 Claims**



1. A fire-resistant safe for protecting stored contents from ambient fire, said safe having a box and a door formed of a thermal insulating material and having a jamb region that is non-linear in cross section where a peripheral region of said door confronts and fits together with a region around an opening in said box, and said safe comprising:

a. the space between said insulating material of said box and said door in said jamb region being substantially filled with a resin material overlying said insulating material, said resin material being combustable at temperatures substantially less than the temperature of said ambient fire;

b. said resin material being substantially thermally non-conductive and arranged to provide means for substantially preventing conduction of heat from said ambient fire through said jamb region to the interior of said box;

c. said space between said insulating material of said box and said door in said jamb region being thin enough relative to the length of said non-linear cross section to provide means for protecting an inner portion of said resin material in said jamb region from combustion in said ambient fire; and

d. said resin material providing means for substantially sealing said jamb region against passage of hot gases from said ambient fire into said interior of said box, said sealing resulting from a charred resin residue adjacent said unburned inner portion of said resin material after said ambient fire burns away an outer portion of said resin material.

4,048,927

PLANT FOR BURNING WASTE

Heinz Mallek; Werner Jablonski, both of Tetz, and Friedhelm Augustin, Julich, all of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

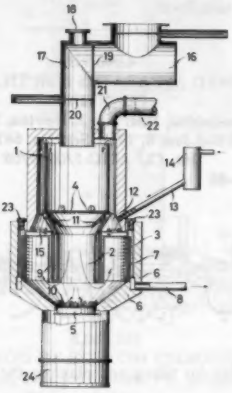
Filed Sept. 11, 1975, Ser. No. 612,475

Claims priority, application Germany, Sept. 14, 1974, 2444125

Int. Cl.[2] F23G *5/00*; F23L *17/00*

U.S. Cl. 110—8 R **12 Claims**

1. A plant for burning waste, which includes: a main combustion chamber having inlet means for receiving waste to be burned and for receiving fresh gases for burning said waste, a post-combustion chamber arranged below said main combustion chamber and open at its top, means for normally providing a down draft through the main combustion chamber into said post-combustion chamber and including therewith a grate interposed between said main combustion chamber and said post-combustion chamber and forming the bottom of said main combustion chamber and the top of said post-combustion chamber, said post-combustion chamber having an opening in its bottom for discharging ashes and residues from the combustion in said main and post-combustion chambers and having a



volume equalling at least the volume of said main combustion chamber, cover means for selectively closing said opening, said post-combustion chamber also being provided with outlet means for discharging waste gas from said post-combustion chamber and a wall structure of highly heat resistant material arranged within said post-combustion chamber and open at its bottom for guiding flue gases passing through said grate toward the bottom of said post-combustion chamber.

4,048,928

APPARATUS FOR DISCHARGING CINDERS FROM AN INCINERATOR

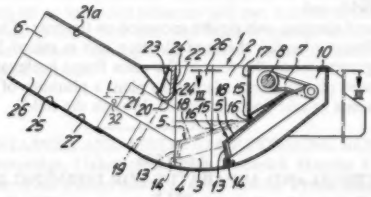
Johannes Josef Martin, Leopoldstrasse 248, 8000 Munich 40, Germany

Filed Aug. 31, 1976, Ser. No. 719,147

Claims priority, application Germany, Sept. 5, 1975, 2539615

Int. Cl.[2] F23J *1/06*

U.S. Cl. 110—165 R **18 Claims**



1. An apparatus for discharging cinders, said apparatus comprising: an intake having horizontally spaced front and rear walls defining an upwardly open cinder-receiving pit; a water-filled trough below said intake having an upwardly concave floor and defining an upwardly extending outlet for quenched cinders extending under said rear wall and away from said pit, whereby cinders falling into said trough through said pit are quenched by the water in said trough; a stepped plunger having a front face slidable in an arcuate path along said floor between a retracted position relatively close to said front wall and an advanced position relatively far from said front wall, an upper surface turned toward and alignable under

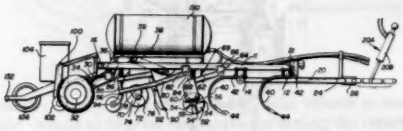
said pit, and a step face turned toward said outlet and lying in back of said front wall in said retracted position and between said walls in said advanced position; and means for advancing said plunger between said positions and thereby sweeping said front wall in said arcuate path across said floor and pushing quenched cinders in said trough with said faces toward said outlet, said step face being inclined relative to said floor so as to exert on said quenched cinders on advance of said plunger from said retracted into said advanced position a component of force toward said floor.

4,048,929

COMBINED APPARATUS FOR TILLING AND PLANTING

Vincent J. Zumbahlen, R.R. No. 3, Newton, Ill. 62448

Filed Jan. 8, 1976, Ser. No. 647,655
Int. Cl.[2] A01C *5/00, 5/08*
U.S. Cl. 111—85 **11 Claims**



1. A machine for tilling and planting the surface of a field comprising:

a frame adapted for movement across a field, said frame adapted to be drawn by a prime mover tractor, the longitudinal attitude of said frame being adjustable from said tractor, whereby the operator of said tractor can independently adjust both the elevation of the front of said frame and the elevation of the rear of said frame;

a plow unit mounted below the forward portion of said frame, said plow unit comprising a plurality of chisel plows adapted to plow the soil as said frame is moved through the field;

a reel unit flexibly mounted below said frame, to the rear of said plow unit, said reel unit extending substantially the width of said plow unit, adapted to rotate as said frame is pulled through the field and thereby pulverize the soil, said reel unit being biased downwardly but being limited as to downward movement and as to depth of soil penetration;

a roller unit flexibly mounted below said frame, to the rear of said reel unit, said roller unit extending substantially the width of said plow unit, and adapted to roll the soil to prepare a seed bed as said frame is pulled through the field; and

a seed planting unit rigidly mounted on the rear of said main frame whereby the seed planting unit is raised from the ground when the rear of the main frame is elevated, said seed planting unit adapted to plant a plurality of rows of seeds as said frame is pulled through the field.

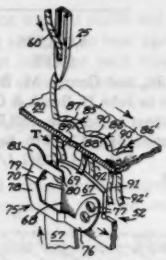
4,048,930

METHOD AND APPARATUS FOR FORMING J-TUFT PILE

Roy T. Card, Chattanooga, Tenn., assignor to Card & Co. Inc., Chattanooga, Tenn.

Filed Mar. 16, 1971, Ser. No. 124,829
Int. Cl.[2] D05C *15/36*
U.S. Cl. 112—79 A **9 Claims**

8. In a tufting apparatus for producing cut pile fabric having reciprocable needle means including a needle, and looper means including a looper having a bill, and a knife, said needle cooperating with one side of said looper to form a loop on said looper, said knife cooperating with the other side of said looper to cut a loop on said looper, a clamping member, mounting means fixing said clamping member relative to said looper and on the same side of said looper as said needle, said clamping member being resilient and having a retaining portion thereof disposed in close juxtaposition with a yarn-carrying portion of



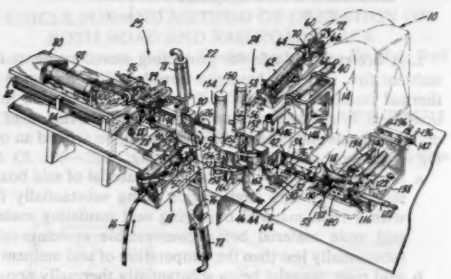
said looper bill for clamping one leg of a cut loop between the retaining portion of said clamping member and said looper bill.

4,048,931

STYLE LOOP FORMING AND ATTACHING APPARATUS

Howard A. Hodgins, Pittsford, N.Y., assignor to The Rochester Button Company, New York, N.Y.

Filed Sept. 22, 1976, Ser. No. 725,426
Int. Cl.[2] D05B *23/00*
U.S. Cl. 112—121.27 **16 Claims**



1. Apparatus for forming a style loop having one end folded over and the other end turned flat under the loop and for attaching the ends of the loop to a surface, the apparatus comprising:

means adjacent the surface for attaching the ends of the loop thereto;

a turning clamp positioned over the surface;

means receiving loop material for folding over one end and for advancing the folded end to the turning clamp and the other end flat to the attaching means;

means operating the turning clamp for thereafter holding the folded end of the loop while the attaching means attaches the flat end to the surface; and

means relatively moving the turning clamp and the surface for turning the loop over the attached flat end and transferring the folded end to the attaching means for attachment to the surface.

15. An attachment for a sewing machine for forming a style loop which is to be sewn to a surface, the style loop having one end folded over and adapted to be sewn to the surface through the folded end and the other end turned under the loop and adapted to be sewn to the surface flat, the attachment comprising:

a turning clamp having a pair of cooperatively closable jaws above the surface which are closed on the folded end of the loop, the fold being upward from the surface and the other end of the loop being positioned flat for sewing to the surface;

means moving the turning clamp toward the flat sewn end for turning the loop over the sewn end; and

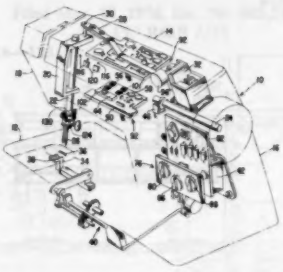
means rotating the turning clamp in the same direction for orienting the upward fold downwardly toward the surface for sewing to the surface through the folded end.

4,048,932

EIGHT STOP MECHANISM FOR SEWING MACHINES

Charles R. Odermann, Montville; Wesley R. Peterson, Bound Brook; John A. Herr, Garwood, and Oswald M. Porter, Livingston, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,632
Int. Cl.² D05B 3/02
U.S. Cl. 112—158 E **5 Claims**



1. In a sewing machine including a housing, an endwise reciprocable needle bar means and needle means removably supported in said needle bar means for movement therewith, jogging means for initiating relative lateral movement of said needle bar means, electric motor means operatively connected to said jogging means such that initiation of the relative lateral movement of said needle bar means is controlled in accordance with movement of said electric motor means, means for generating electrical input signals in accordance with predetermined stitches in a plurality of selected patterns and for connecting said electrical input signals to said electric motor means, said electric motor means having a work output proportional to said electric input signals, and circuit means including switch means for limiting the magnitude of the electrical input signals to said electric motor means, said circuit means being operative for reducing said electrical input signals a fixed percentage each time said switch is actuated whereby upon actuation of said switch means the maximum extent of lateral movement of said needle bar means for any selected pattern will be limited and means responsive to the insertion of a needle means in said needle bar means for automatically actuating said switch means.

4,048,933

CONTAINER HEAD FORMING

Warren N. Hubert, Duncanville, Tex., assignor to Dixico Inc., Dallas, Tex.

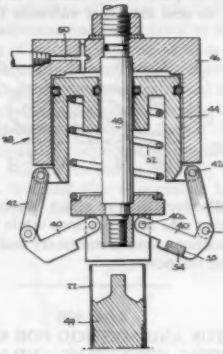
Filed Apr. 5, 1976, Ser. No. 673,444
Int. Cl.² B21D 51/36, 37/06
U.S. Cl. 113—1 B **6 Claims**

1. Apparatus for manufacturing a collapsible squeeze tube comprising:

a form adapted to hold and position a collapsible cylinder such that one end of the cylinder extends free of said form,

pleating means to form a plurality of pleats at the free end of whatever cylinder is held by said form, each of said pleats having a shoulder portion and a neck portion, said shoulder portion being intermediate between said neck portion and the uncrimped cylinderical body portion,

creasing means to crease the same side of each of said pleats with a transverse crease at approximately the line between said shoulder portion and said neck portion, and



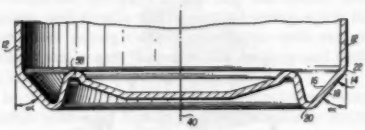
biasing means to partially fold over at least the neck portion of each of said pleats in the same circumferential direction.

4,048,934

METHOD OF BOTTOM EMBOSSING

Joseph W. Wallace, Henrico County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed July 29, 1976, Ser. No. 709,905
Int. Cl.² B21D 51/26
U.S. Cl. 113—120 H **3 Claims**



1. A method of embossing the bottom of a container of the type formed between a bottom-former element and a punch element of a can press, said method comprising the steps of:

providing recessed indicia on one of said elements for indicating that said container is produced by said can press;

providing a blank surface on the coactive portion of said other element;

and ramming the can bottom between said punch element and said bottom-former element; and, in so doing, trapping air or lubricant adjacent said can bottom so that said indicia is embossed into said bottom by said air or lubricant without leaving objectionable stress concentrations in said bottom.

4,048,935

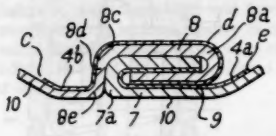
CONTAINER AND METHOD OF FORMING SAME

John Beveridge, Uxbridge; Thomas Roderick Harries Davies, Pinner; Fred Fidler, Cuffley, and Maurice Frank Ring, Epsom, all of England, assignors to Metal Box Limited, England

Division of Ser. No. 523,928, Nov. 14, 1974, Pat. No. 4,003,492.
This application Oct. 29, 1976, Ser. No. 736,817
Int. Cl.² B21D 51/28
U.S. Cl. 113—120 F **8 Claims**

1. A method of forming a container body having a side seam of the hook type comprising the steps of providing a body blank having two opposite faces, forming the body blank to have hook portions along opposite edges of a main portion thereof with the hook portions having bonded thereto adhesive strips applied to a single face of said body blank and extending beyond the hook portions into the main portions, forming the body blank into tubular shape, interlocking the hooks, flattening the hook portions to form a side seam and to maintain the

interlocked relationship of the hook portions and to clamp the adhesive strips in opposed contacting relation between the hook portions with parts of the adhesive strips extending out of the side seam to seal the usual entrance thereinto, and heat



treating the adhesive strips to effect bonding of the adhesive strips to adjacent side seam portions while the flattened interlocked hook portions remain stationary and hold the side seam portion in fixed relation.

4,048,936

APPARATUS AND METHOD FOR SELECTIVELY SUPPORTING, CONVEYING AND MOUNTING A PROPELLER AND RUDDER

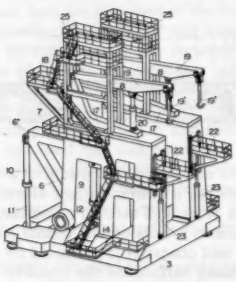
Kazuhiro Uchizono; Kentaro Yamada, both of Tsu; Kenji Saito, Hisai; Takato Taninaka; Yoshinari Abe, both of Tsu; Masayoshi Ishii, Gifu; Hiroo Nakayama, Mie, and Sachio Futatsuki, Machida, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha; Kayaba Kogyo Kabushiki Kaisha and Nihon Koki Kabushi Kaisha, all of Tokyo, Japan

Filed June 8, 1976, Ser. No. 693,907

Claims priority, application Japan, June 11, 1975, 50-70578

Int. Cl.[2] B63B *3/00*

U.S. Cl. 114—65 R **5 Claims**



1. A propeller and rudder supporting, conveying and mounting apparatus comprising a frame including a conveying structure, a scaffold mounted on said frame, and mounting means mounted on said scaffold for selectively supporting a propeller and a rudder and mounting the same in a predetermined position, said frame means comprising an upper frame member and a lower frame member, each including four jacks mounted thereon, a double-rod jack connected to said upper frame member on the underside thereof and including two rods extending from said jack and supported at their ends by the lower frame member; said lower frame member including two jacks for turning and moving the lower frame member back and forth, said two jacks including two rods connected to said two rods of said double-rod jack; sliding contact means between said two frame members; and a pair of scaffolds erected on the frame means and having a space therebetween to selectively accommodate a propeller and a rudder; said mounting means comprising fine adjustment means mounted on said scaffolds respectively for lifting, lowering and positioning the propeller and rudder.

5. A method of selectively supporting a propeller and a rudder and for mounting the same in a predetermined position by a scaffold erected on a conveyable frame structure, comprising the steps of: supporting the rudder by a plurality of pairs of jacks for handling the same and carrying the rudder higher than a lower gudgeon; conveying the rudder to a position where the pintle of the rudder is fittable in a bore of the lower gudgeon; and after said pintle is fitted in said bore, disengaging both ends of holding means supporting the rudder from the jacks thereby permitting the support for the propeller and rudder to move away from the position for the mounting operation.

4,048,937

CARGO CARRYING VESSEL HAVING AT LEAST ONE CARGO CARRYING DECK

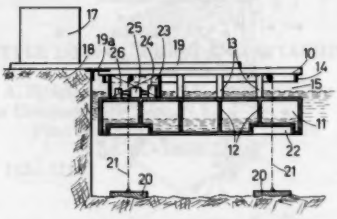
Klas Heyman, Goteborg, Sweden, assignor to AB Gotaverken, Goteborg, Sweden

Filed Dec. 10, 1975, Ser. No. 639,622

Claims priority, application Sweden, Dec. 27, 1974, 7416293

Int. Cl.[2] B63B *25/00*

U.S. Cl. 114—72 **1 Claim**



1. In a cargo carrying vessel having at least one cargo carrying deck and suited for cargo handling in a horizontal plane to and from an embankment, anchors for location at the bottom of the sea below the vessel,

devices for connecting said vessel to said anchors, and

further means for varying the distance between said deck and said anchors, trimming tanks forming part of a pontoon divided into a number of cells and adapted during transfer of cargo always to remain below water level for providing an excess of buoyant force when positioning said at least one cargo carrying deck at a level substantially corresponding to the embankment level, a number of pillar structures connecting said pontoon with said deck, a side shell-plating enclosing a space between said deck and said pontoon, openings in said plating, means for temporarily closing said openings, and pumping means for displacing water in to and out of said cells.

4,048,938

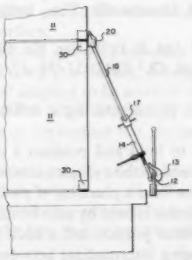
CONTAINER LASH SYSTEMS

W. W. Patterson, III, and Eugene F. Grapes, both c/o W. W. Patterson Co., Pittsburgh, Pa. 15222

Filed Sept. 8, 1975, Ser. No. 611,200

Int. Cl.[2] B63B *25/24*

U.S. Cl. 114—75 **2 Claims**



2. A container corner casting comprising a base, a shaft

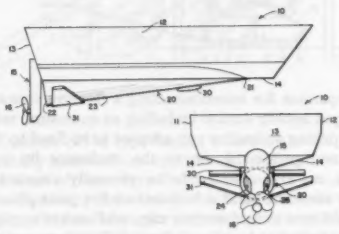
extending from one side of said base and having a locking cam member at the end remote from the base and at least one generally ball shaped socket on the base opposite the shaft, said socket having a keyhole shaped opening providing access thereto, said casting having a pair of generally ball shaped sockets on the base opposite the shaft, said sockets having keyhole shaped access openings thereto at about 45° to one another.

4,048,939

FREE-FLOODING CHAMBER STRUCTUREMOUNTABLE ON THE UNDERSIDE OF A WATERCRAFT

Allen Jones, Jr., 5028 Lauderdale Ave., Virginia Beach, Va. 23455

Filed Mar. 10, 1976, Ser. No. 665,715
Int. Cl.[2] B63B *1/16*
U.S. Cl. 114—125 **16 Claims**



1. Apparatus for enhancing the operating efficiency and stability of a power boat, comprising:

a. a hollow, elongated structure exteriorly mountable on the underside of a boat to define a chamber extending exteriorly along the underside of and substantially paralleling the length of the boat;

b. the structure having forward and rearward end regions and having an outer surface which extends in length therebetween;

c. the forward end region defining a substantially pointed, closed end formation positionable substantially adjacent the forward end of the wetted surface area of the underside of the boat when said boat is at rest in the water;

d. the rearward end region defining a rearwardly facing opening positionable completely beneath the underside of the boat communicating with the chamber permitting the passage of water therethrough (i) to substantially fill the chamber and thereby stabilize the boat when the boat is at rest in the water and (ii) to empty the chamber and thereby reduce the effective mass of the boat when the boat is underway; and

e. the outer surface being tapered along its entire length to progressively increase the cross-sectional area of the structure as it provides a smooth transition from the pointed forward end formation to the rearward end region thereby forming a planing surface which operates to lift the boat in the water when it is underway to reduce the wetted surface area of the boat.

4,048,940

TROLLING ATTACHMENT FOR OUTBOARD ENGINE

William L. Smith, 1156 Blewett Ave., San Jose, Calif. 95125

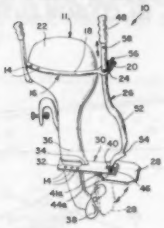
Filed Mar. 18, 1977, Ser. No. 779,165
Int. Cl.[2] B63H *25/48*
U.S. Cl. 114—145 A **8 Claims**

1. A trolling attachment for an outboard engine comprising in combination:

first attachment means adapted to be detachably secured to an upper section of the housing of an outboard engine and having a first aperture therein dimensioned to slidably receive an elongated handle rod therein;

second plate-like attachment means adapted to be detachably secured adjacent one end thereof to a lower section of the housing of an outboard engine so as to extend substantially horizontally beyond the location of the engine propeller, second aperture being provided in said platelike attachment means adjacent the other end thereof dimensioned to slidably receive the handle rod therein;

a trolling flap hingedly connected to the lower surface of said plate-like attachment means inwardly to said second aperture such that said flap is pivotable between a first horizontal position closely adjacent the lower surface of



said plate-like attachment and a second vertical position spaced rearwardly of the engine propeller, means being provided on said flap for pivotably mounting the lower extremity of the handle rod;

an elongated handle rod of sufficient length to extend through the apertures in said first and second attachment means, said handle rod having a locking notch formed in the lower region thereof cooperable with said plate-like attachment means for releasably locking said trolling flap in its vertically disposed position;

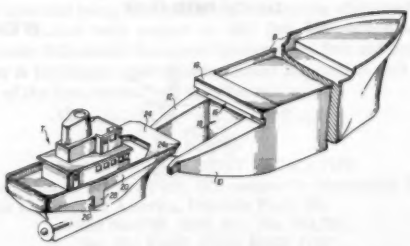
and latch means carried by said first attachment means cooperable with said handle rod for releasably locking said handle rod in a selected vertical position.

4,048,941

SEAGOING COMPOSITE BARGE-TUG VESSEL

Peter John Legnos, 973 North Road, Groton, Conn. 06340

Filed May 10, 1976, Ser. No. 684,648
Int. Cl.[2] B63H *28/00*
U.S. Cl. 114—248 **39 Claims**



29. A tug adapted for use as part of a composite tug-barge vessel, said tug comprising a bow including sidewalls, a prow tongue which extends across the bow thereof and projects outwardly from the bow, first and second laterally extending wings distinct from said sidewalls and defining first and second inclined, continuous, downwardly facing mating planes so as to present a single continuous planar mating surface on each side of the tug which extends rearwardly from said prow tongue for engaging the corresponding mating planes of a barge and sliding longitudinally therealong, and connection

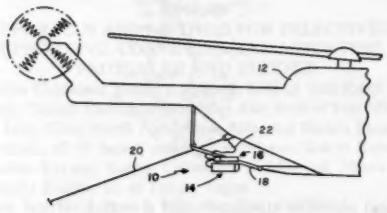
means located at the innermost ends of said mating planes on opposite sides of said tug and defining first and second connection apertures, said tug further comprising means located at said connection means for preventing lateral movement between the tug and the barge of the tug-barge vessel, and position fixing means for fixing the longitudinal positions of the tug and barge when the two are engaged.

4,048,942

HELICOPTER TOWLINE RECOVERY BUOY SYSTEM

Charles C. Cotton, and Guy S. D. Jencks, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 22, 1977, Ser. No. 770,732
Int. Cl.[2] B63B *21/56*
U.S. Cl. 114—253 **11 Claims**



1. A towline recovery system for use with a helicopter equipped with a droppable towline, said system comprising:

a retrieval line and float package comprising a housing, an attachment member on said housing, a retrieval line coiled in said housing and having a first end portion extending therefrom and connected to said towline, inflatable float means disposed in said housing and connected to a second end portion of said retrieval line, and means for inflating said float means; and

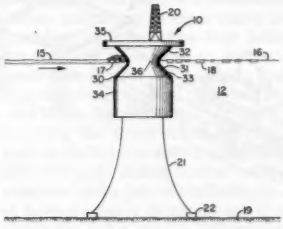
attachment and release means, mounted on said helicopter and cooperable with said attachment member, for securing said package to said helicopter and for releasing said package in response to dropping of said towline.

4,048,943

ARCTIC CAISSON

Ben G. Gerwick, Jr., San Francisco, Calif., assignor to Exxon Production Research Company, Houston, Tex.

Filed May 27, 1976, Ser. No. 690,469
Int. Cl.[2] B63B *35/08*
U.S. Cl. 114—256 **19 Claims**



1. An offshore structure which is adapted for operation in an arctic sea containing floating ice masses comprising:

a floating caisson, said caisson having a radially downwardly tapered upper ice-breaking portion;

a plurality of mooring lines secured at a first end to said caisson and at a second end to the sea floor; and

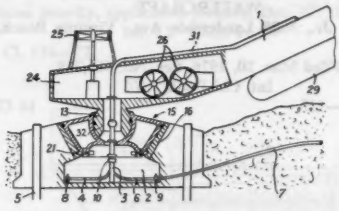
means for vertically moving said caisson a sufficient distance and with sufficient dynamic force so that said upper portion of said caisson obliquely contacts and breaks said ice masses.

4,048,944

INTERCONNECTION OF A FLOATING STRUCTURE AND A SUBMERGED ANCHOR STATION

Jean Louis Corgnet, Boulogne, France, assignor to Compagnie Francaise des Petroles, Paris, France

Filed Feb. 23, 1976, Ser. No. 660,589
Claims priority, application France, Feb. 21, 1975, 75.05418
Int. Cl.[2] B63B *21/50*
U.S. Cl. 114—293 **14 Claims**



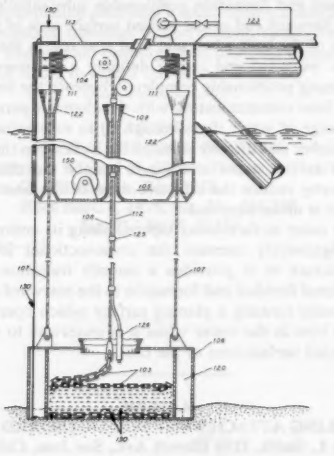
1. Apparatus for interconnecting a floating structure and a submerged anchor station including an enclosure, said apparatus comprising an anchor cap adapted to be fixed to the anchor station and pressed down to the enclosure by hydrostatic pressure, an arm adapted to be pivotally connected to the floating structure, and a ball-and-socket joint pivotally coupling said arm to said anchor cap, said socket engaging more than one half of the surface of said ball to form a rigid pivotal coupling.

4,048,945

REMOVABLE ANCHOR HAVING RETRIEVABLE BALLAST

Sidney J. Shrum, Charlotte, N.C., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 7, 1976, Ser. No. 684,343
Int. Cl.[2] B63B *21/24*
U.S. Cl. 114—294 **12 Claims**



1. A removable anchor for a floating vessel, comprising:

a retrievable ballast chain having a density greater than water, said retrievable ballast chain lowerable from said floating vessel;

means secured to said vessel floating on a body of water for lowering and raising said ballast chain; and

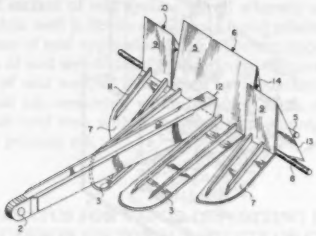
retrievable enclosure means positionable on the bottom of said body of water, for containing said ballast chain lowered into said retrievable enclosure means, so that the combined weight of said ballast chain and said retrievable enclosure means form a fixity for anchoring said vessel.

4,048,946

ANCHOR WITH INDEPENDENT PAIRS OF FLUKES

Henry C. Mayo, 8319 Midwood St., Alexandria, Va. 22308

Filed Sept. 8, 1976, Ser. No. 721,642
Int. Cl.² B63B *21/24*
U.S. Cl. 114—307 **6 Claims**



1. In an anchor of the type having a shank, a set of primary flukes pivotally mounted on opposite sides of one end of the shank, and a set of secondary flukes of a length less than the length of said primary flukes mounted on the same sides of said shank as the primary flukes, the improvement comprising:

a. a first crown assembly including tripping and rear crown plates affixed to the primary flukes as an extension thereof;

b. a second crown assembly including tripping and rear crown plates affixed to each of the secondary flukes as an extension thereof;

c. stopping surfaces on said one end of the shank which contact said first crown assembly when said flukes are pivotally rotated a fixed number of degrees to either side of said shank;

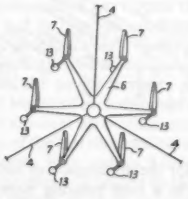
d. stopping means attached to the second crown assemblies in a position such that they engage a surface on said first crown assembly when said second crown assemblies are rotated a prescribed number of degrees relative to said first crown assembly wherein said fixed angle and said prescribed angle are such that the secondary flukes will form a larger angle with respect to said shank than said fixed angle.

4,048,947

ROTARY DEVICE DRIVEN BY A MOVING FLUID

Charles Andre Sicard, 29 rue Dierville, 6211 Bucquoy, France

Filed Jan. 20, 1976, Ser. No. 650,742
Claims priority, application France, Jan. 22, 1975, 75.01907
Int. Cl.² B63H *13/00*
U.S. Cl. 115—3 **13 Claims**



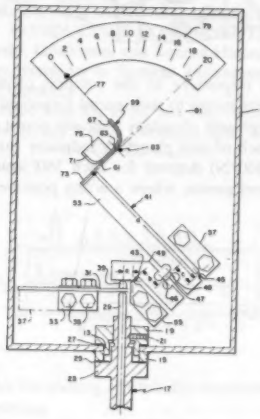
1. A rotatable device powered by a moving fluid such as water or air, comprising a generally cylindrical rotor disposed for rotation about a vertical axis, a plurality of blades mounted on said rotor adjacent its periphery for free unrestrained rotation, in normal usage, through 360° about essentially vertical axes passing through said blades, each of said blades having a symmetrical aerodynamic profile and a leading edge remote from the blade axis, a counterweight rigid with each of said blades, said blades and counterweight being constructed such that the center of gravity of each blade and its associated counterweight is spaced from associated blade axis and lies in a plane passing through the blade axis and which is perpendicular to a chord connecting said axis and the blade leading edge.

4,048,948

PRESSURE GAUGE

Neil L. Sarasohn, San Jose, Calif., assignor to Gentran Inc., Sunnyvale, Calif.

Filed Mar. 4, 1976, Ser. No. 664,014
Int. Cl.² G01L *7/00*; G01D *13/00*
U.S. Cl. 116—114 PV **12 Claims**



1. A pressure gauge comprising a cause, a push rod carried by said case and adapted to be coupled at one end to a source of pressure to be measured, lever means having one end coupled to the other end of said push rod, and spring means coupled to the other end of said lever means, said spring means including first, second and third tapes secured together at one end, the other end of said first tape being secured to said lever means, the other end of said second tape being secured to said case, the third tape being disposed between said first and second tapes and being formed of a material having a low coefficient of friction with respect to said first and second tapes whereby differential movement between said first and second tapes is facilitated, and indicator means disposed at said one end of the first, second and third tapes.

4,048,949

PLANETARY TURRET INDICATOR

Hans Schmidt, Schiller Park, Ill., assignor to Matsushita Electric Company of America, Franklin Park, Ill.

Filed Nov. 15, 1976, Ser. No. 741,711
Int. Cl.² F16H *35/00*; H03J *1/02*
U.S. Cl. 116—124.3 **10 Claims**

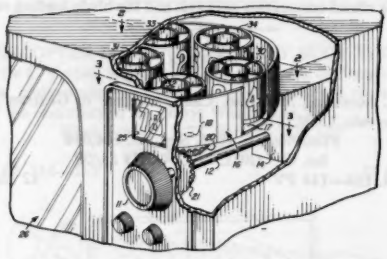
1. A turret indicator for providing numerical indications of relative rotational positions of a rotating member including, in combination:

a rotatable carrier turret means rotatable to N predetermined equi-angular spaced rotational positions within each complete 360° rotation thereof, where N is a positive integer greater than 1;

means for rotating said carrier turret means;

N planetary indicator turret members, each having N equi-angular spaced indicia portions thereon, each indicia por-

tion associated with a segment comprising 360/N degrees of such planetary indicator turret member, and said N planetary indicator turret members being mounted on said rotatable carrier turret means and being spaced each 360/N degrees about the axis of rotation of said carrier turret means; and



drive means responsive to the rotation of said rotatable carrier turret means to said spaced rotational position and coupled with said planetary indicator turret members for rotating each of said planetary indicator turret members $360n \pm (360/N)$ degrees for each 360° rotation of said carrier turret means, where n is any positive integer.

4,048,950

DEVICES FOR APPLYING ADHESIVES TO A MOVING WEB

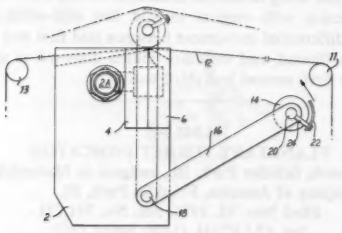
Jan Antoni Rakowicz, and Brian Harrison, both of London, England, assignors to Molins Limited, England

Filed Oct. 30, 1975, Ser. No. 627,280

Claims priority, application United Kingdom, Nov. 2, 1974, 47481/74

Int. Cl.² B05C *5/02*

U.S. Cl. 118—6 **11 Claims**



1. A device for applying adhesive to a moving web, comprising a nozzle against which the web is arranged to run and from which adhesive is to be delivered, guide means for feeding the web along a path which bends around the nozzle, a closure member which is mounted on the same side of the said path as the nozzle, and means for moving the closure member between a position in which it allows the web to run against the nozzle and a position in which it holds the web away from the nozzle and lies against the nozzle so as to stop the flow of adhesive from the nozzle.

4,048,951

APPARATUS FOR APPLYING A GLASS FRIT TO A SEAL EDGE OF A FUNNEL PORTION OF A PICTURE TUBE

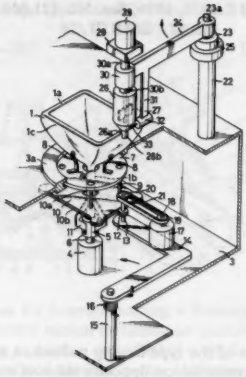
Michio Tamura, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 6, 1975, Ser. No. 602,362

Claims priority, application Japan, Aug. 14, 1974, 49-92971

Int. Cl.² B05C *5/02, 13/00*

U.S. Cl. 118—6 **7 Claims**



1. An apparatus for applying glass frit to an end surface of the funnel portion of a picture tube, which end surface is of varying width; said apparatus comprising a rotatable turntable for supporting said funnel portion with said end surface facing upwardly; a container for the glass frit having a nozzle at the bottom thereof for discharging the glass frit at a substantially constant rate; means supporting said container for positioning said nozzle over said end surface of the funnel portion; means for rotating said turntable and the funnel portion thereon; and means for varying the speed of rotation of said turntable in the course of each revolution thereof so that the relative speed between said nozzle and said end surface therebelow is varied substantially in inverse proportion to variations in said width of the end surface.

4,048,952

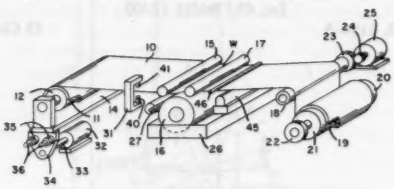
DIRECT RIBBON INKING BY GRAVURE

Glenn E. Peterson, Carle Place; Robert T. Emerson, Manhasset, and William J. Schoenlein, Levittown, all of N.Y., assignors to Columbia Ribbon & Carbon Mfg. Co., Inc., Glen Cove, N.Y.

Filed Apr. 12, 1976, Ser. No. 676,301

Int. Cl.² B05C *11/00, 11/04, 1/08*

U.S. Cl. 118—6 **8 Claims**



1. An apparatus for the application of sufficient amounts of liquid printing ink to a used printing ribbon, comprising an ink-absorbent fabric web containing an unveven distribution of residual printing ink, to provide said fabric web with an even, uniform impregnation of printing ink, comprising a web-supply roll, an ink-applicator roll having a gravured surface, and a web-windup roll, means for transporting under tension a continuous length of a used printing ribbon, comprising an ink-

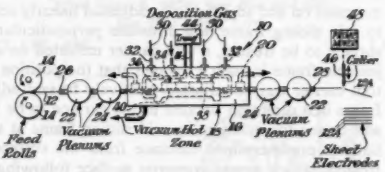
absorbent fabric web containing an uneven distribution of residual printing ink, from said supply roll, over a portion of the gravured surface of said applicator roll and onto said windup roll, means for turning said applicator roll in the same direction as said web is transported but at a surface speed which is slower than the speed of said web so as to place a drag thereon, means for supplying liquid printing ink to the gravured surface of said applicator roll, blade means associated with the inked gravured surface of said applicator roll for removing said liquid printing ink from the surface of said applicator roll except for ink within the recesses of said gravured surface, and means for maintaining said ink-absorbent fabric web in compression-free contact with the inked gravured surface of said applicator roll whereby said ink-absorbent fabric web is free to absorb said liquid printing ink from the recesses of said applicator roll in different amounts across the width of said web to satisfy the different degrees of ink-absorbency of said web, as determined by the different amounts of residual ink remaining within different areas of said web, to provide said web with a uniform, even impregnation of said liquid printing ink.

4,048,953

APPARATUS FOR VAPOR DEPOSITING PYROLYTIC CARBON ON POROUS SHEETS OF CARBON MATERIAL

Robert W. Froberg, Easton, Pa., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 480,922, June 19, 1974, Pat. No. 3,944,686. This application Dec. 19, 1975, Ser. No. 642,607
Int. Cl.² C23C *13/08*
U.S. Cl. 118—49 **27 Claims**



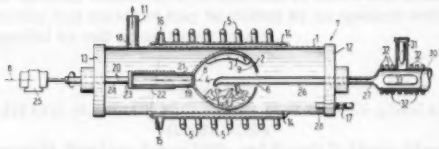
1. An apparatus for the continuous vapor deposition of pyrolytic graphite on a porous fibrous sheet of carbon material comprising a subatmospheric pressure chamber, a pair of elongated guide plates disposed parallel to and adjacent to each other within the chamber forming a narrow slot between them through which the porous fibrous carbon sheet is longitudinally traversed, flow passes though said plates having substantially restricted flow areas, the flow passages intersecting the slot, exhaust means connected to the chamber for maintaining the subatmospheric pressure in the chamber, feed means for causing the elongated porous fibrous sheet of carbon to longitudinally move through the slot, electrical heating means associated with at least one of the guide plates for heating it and the sheet adjacent it, a source of hydrocarbon gas under pressure connected to the flow passages for causing the relatively high velocity flow of hydrocarbon gas to pass through and to cool the flow passages and to impinge upon the sheet whereby a deposit of pyrolytic graphite is infiltrated on the sheet without clogging the flow passages seal means including at least at one end of the apparatus, the device having a pair of endless belts having a substantial length of each disposed substantially parallel to form a sheath adjacent each other, and said sheath intersecting an extension of the slot disposed between the pair of the elongated guide plates in a region having subatmospheric pressure whereby the sheath is caused to closely envelope and support the porous fibrous sheet of material as a result of the differential pressure of ambient atmospheric pressure relative to the subatmospheric pressure between the belts in the sheath, a pointed nose piece attached to the said one end of the apparatus, the endless belt device being constructed and arranged to cause the belts to be disposed close to the nose piece just ahead of the sheath and belt guide means on the endless belt device which contacts the belts adjacent the end of the pointed nose piece for maintaining the endless belts close to it whereby a vacuum seal is provided for the chamber, a subatmospheric antechamber disposed on the chamber in the path of travel of the porous fibrous sheet material, and the pointed nose piece being connected to the end of the subatmospheric antechamber.

4,048,954

COATING DEVICE FOR SMALL ELECTRICALLY CONDUCTIVE COMPONENTS

Alfred Politycki, Ottobrunn, and Konrad Hieber, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 19, 1976, Ser. No. 715,940
Claims priority, application Germany, Sept. 4, 1975, 2539434
Int. Cl.² C23C *13/08*
U.S. Cl. 118—49.1 **14 Claims**



1. Apparatus for coating electrically conductive small components comprising

A. an electrically non-conductive drum member having
   1. a longitudinal axis
   2. continuously interiorly concavely curved side walls,
   3. radially inwardly projecting longitudinally extending rib members associated with said side walls, and
   4. an aperture defined in one end region thereof about said axis,

B. a gas-tight vessel located exteriorly about said drum member in spaced relationship thereto, portions of said drum member adjacent said vessel being electrically non-conductive, said vessel having a gas output orifice defined therein,

C. shaft means associated fixedly with said drum member and axially extending outwardly from the opposed end region thereof through a first wall portion of said vessel, said shaft means including sealing means therefor adjacent said first wall portion, said shaft means being electrically non-conductive in regions thereof adjacent said drum member, said shaft means including bearing means adapting said shaft means for axial rotational movements,

D. a power head functionally associated with said shaft means exteriorly of said vessel and adapted to drive rotatably said shaft means,

E. electric inductive heating coil means circumscribing said vessel about portions thereof adjacent said drum member, and

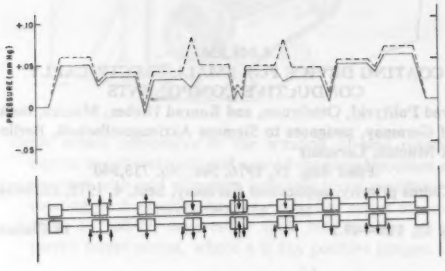
F. conduit means for delivering a thermally decomposable gas into said first vessel, said conduit means extending continuously from a position exteriorly of said vessel through a second wall portion of said vessel and through said aperture, said conduit means terminating in an output orifice in said drum member, said conduit means including sealing means therefor adjacent said second wall portion.

4,048,955

CONTINUOUS CHEMICAL VAPOR DEPOSITION REACTOR

Roger Norman Anderson, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 2, 1975, Ser. No. 609,879
Int. Cl.[2] C23C *13/10*
U.S. Cl. 118—49.5 8 Claims



1. A continuous chemical vapor deposition reactor comprising:

an elongated central core having a restricted opening at each end communicating to the outside atmosphere;

a plurality of junction units interdisposed between said ends and dividing said elongated central core into a plurality of interconnected chambers comprising sealing chambers and substrate treating chambers and each unit having a restricted passageway therethrough aligned with and communicating adjacent ones of said chambers;

a plurality of substrate carriers and spacers travelling into, through and out of said elongated central core;

a plurality of viscous loss seals formed by means of the propinquity between said passageways and openings and said substrate carriers and spacers;

said plurality of substrate carriers and spacers operatively associated with said elongated central core whereby to divide said core into a continuous elongated substrate treating and handling section comprised of said sealing and substrate treating chambers and a coextensive opposed section, said sections being isolated from each other;

each of said junction units communicating with said opposed central core section and collectively providing means to subject adjacent isolated chamber portions comprising said opposed section to either an exhaust means or to a flush gas; and

each of said junction units communicating with said substrate treating and handling core section and collectively providing means to subject adjacent isolated chamber portions comprising said treating and handling section with appropriate ones of sealing gases, substrate treatint gases and exhaust means;

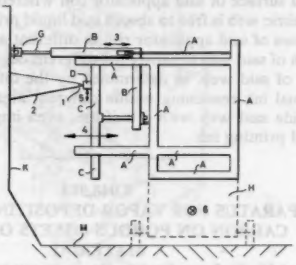
whereby all of the chamber sections are maintained isolated frome one another and from ingress of the atmosphere.

4,048,956

APPARATUS FOR TREATING A SURFACE

Joseph Estebanez, Upton-by-Chester, England; David V. Harrison, Flint, Wales; Clifford P. Jones, Ellesmere Port; Wirral, and Henry G. E. Wilson, Chester, both of England, assignors to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Apr. 7, 1976, Ser. No. 674,489
Claims priority, application United Kingdom, June 4, 1975, 24100/75
Int. Cl.[2] B05B *13/06*
U.S. Cl. 118—306 4 Claims



1. Apparatus for treating a surface, comprising:

a first frame adapted to be moved across the surface to be treated, a sliding frame mounted on and adapted to slide linearly relatively to said first frame in a direction perpendicular to the surface to be treated, an adjustable frame mounted on and adapted to be adjusted linearly relatively to said sliding frame in a direction perpendicular to the surface to be treated, a tool carrier mounted on said adjustable frame in such a manner that the position of said tool carrier can be adjusted relatively to said adjustable frame in a direction parallel to the surface to be treated, and means for maintaining said sliding frame at substantially a predetermined distance from the surface to be treated, which means comprise surface following means carried by said sliding frame and cooperating with said adjusting means arranged between said first frame and said sliding frame.

4,048,957

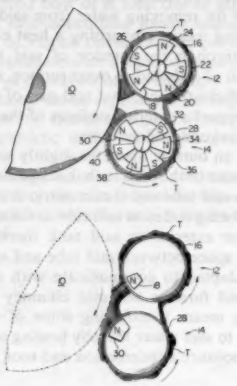
MAGNETIC BRUSH DEVELOPING APPARATUS FOR ELECTROPHOTOGRAPHY

Kazuaki Tagawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 14, 1975, Ser. No. 621,882
Claims priority, application Japan, Oct. 18, 1974, 49-120078
Int. Cl.[2] G03G *13/00*
U.S. Cl. 118—653 9 Claims

1. A magnetic brush developing apparatus for applying toner particles to a photoconductive member, comprising, in combination, first and second rotary magnetic brush means which have the same magnetic polarity and are spaced from each other, said second magnetic brush means being disposed closer to the photoconductive member than the first magnetic brush means, said first magnetic brush means comprising a first non-magnetic cylindrical member with a first magnet mounted within the first cylindrical member, said second magnetic brush means comprising a second non-magnetic cylindrical member with a second magnet mounted within the second cylindrical member, and magnetic fields of the first and second magnetic brush means comprising at a first angular orientation of the first and second magnetic brush means to allow toner particles from the first magnetic brush means to be thrown by centrifugal force onto a portion of the photoconductive member to perform cascade development and the second magnetic brush means slidingly contacting the portion of the photocon-

ductive member at a subsequent second angular orientation of the first and second magnetic brush means to perform magnetic brush development, said first and second magnets being



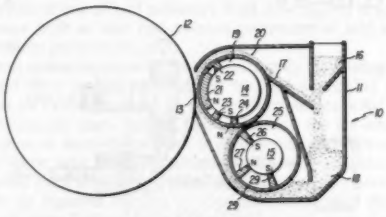
arranged to be adjacent to each other at the first angular orientation of the first and second magnetic brush means such that magnetic fields thereof constitute said magnetic fields.

4,048,958

MAGNETIC BRUSH DEVELOPING DEVICE

Michiharu Nakaguchi, and Toshio Nagashima, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1976, Ser. No. 664,680
Int. Cl.² B05B 5/02
U.S. Cl. 118—658 **1 Claim**



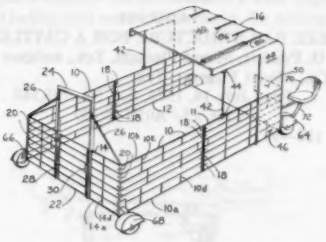
1. A magnetic brush developing device comprising a developing roller including a cylindrical stationary magnet and a sleeve rotatably mounted around said magnet, said developing roller being disposed adjacent the surface of a latent image bearing member, said cylindrical magnet having a developing magnetic pole facing the surface of said latent image forming member and transporting magnetic poles respectively disposed above and below said developing magnetic pole in adjacent relation thereto, said transporting magnetic poles being narrower in width than and having an opposite polarity to said developing magnetic pole, said cylindrical magnet having an auxiliary magnetic pole disposed adjacent the transporting magnetic pole, the polarity of said auxiliary magnetic pole being the same as that of said developing magnetic pole, a developer reservoir and a transporting roller including a second cylindrical stationary magnet and a second sleeve rotatably mounted around said second magnet, said transporting roller being disposed below said developing roller and adjacent said developer reservoir, said second cylindrical magnet having a first magnetic pole being of opposite polarity to and disposed adjacent to and in facing relation to said auxiliary magnetic pole to smooth the delivery of the developer from said transporting roller to said developing roller, said second cylindrical magnet having further poles to effect the delivery of said developer from said reservoir to said first magnetic pole.

4,048,959

MOBILE CORRAL

James E. Steele, 1425 E. Magee Road, Tucson, Ariz. 85718

Filed July 15, 1976, Ser. No. 705,405
Int. Cl.² A01K 1/02
U.S. Cl. 119—20 **9 Claims**



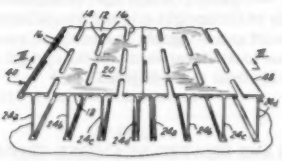
1. A self-propelled corral enclosure to pen animals comprising a plurality of connected fence sides forming an enclosure, a plurality of wheel means attached to said fence sides, steering means operably connected to at least one of said wheel means, and prime mover means permanently attached to one of said fence sides and made a part thereof, said prime mover means also operably connected to at least one of said wheel means whereby said enclosure may be steered by an operator while propelled by said prime mover means.

4,048,960

SLOTTED SURFACE FLOORING FOR USE IN ANIMAL HUSBANDRY

Thomas O. Barnidge, Sunset Hills, and Russell D. Hasty, Maryland Heights, both of Mo., assignors to Danforth Agri-Resources, St. Louis, Mo.

Filed May 5, 1976, Ser. No. 683,323
Int. Cl.² A01K 1/00; F04C 1/30
U.S. Cl. 119—28 **3 Claims**



1. A flooring structure for use in animal husbandry comprising: a floor assembly constructed of a plurality of individual lengths of extruded material, each of said lengths having a flooring surface with transverse side margins, a top surface and an undersurface, at least three support beams extending normal to said undersurface from said undersurface, said support beams extending longitudinally of the length of said lengths, said support beams terminating in increased dimension footed ends, a plurality of longitudinally spaced apart slots through said flooring surface intermediate adjacent support beams, longitudinally continuous raised stiffening ribs extending the length of said lengths projecting from the undersurface adjacent the slots on either side thereof, one of said side margins having an arcuate male connection configuration portion projecting therefrom, the male portion defining an open top longitudinally extending groove, the other of said side margins having an arcuate female connection portion extending thereinto, the male portion of one length receivable in the female portion of an adjacent length, and said adjacent lengths being transversely coupled together by the indexing of said connect-

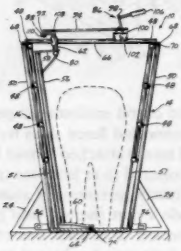
ing portions, an additional row of longitudinally spaced apart slots provided at the side edge having the male coupling member with the slots of said additional row of slots formed partially through portions of said male portion projection, including portions of a bottom of the groove, and at least partially formed through adjacent portions of the flooring surface.

4,048,961

SQUEEZE BAR STRUCTURE FOR A CATTLE CHUTE

William D. Priefert, Mount Pleasant, Tex., assignor to Priefert Mfg. Co., Mount Pleasant, Tex.

Filed July 14, 1976, Ser. No. 705,143
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—96 **11 Claims**



1. An animal squeeze structure for a cattle chute comprising a base frame and a pair of transversely spaced longitudinally extended upright side panels mounted on said base frame having forward and rearward ends, said squeeze structure including:

a. an upright squeeze bar located between and intermediate the ends of said panels, and

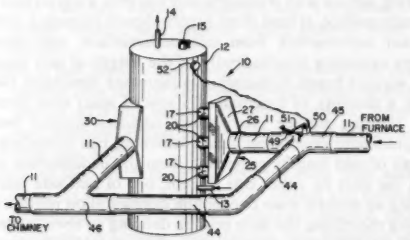
b. means on said side panels and base frame supporting said squeeze bar for swingable movement transversely of the chute toward and away from one of said panels about an upright axis situated inwardly from said one panel, said squeeze bar, from a rest position adjacent said one panel, being swingable to a first operative position located forwardly of the upright axis and spaced inwardly from said one panel and swingable rearwardly to a second operative position located rearwardly of the upright axis and spaced inwardly from said one panel.

4,048,962

WATER TANK HEATED BY SMOKE FROM A FURNACE

Stanley Pristelski, Rte. 1, Box 132c, Marinette, Wis. 54143

Filed May 10, 1976, Ser. No. 684,793
Int. Cl.[2] F22B *33/00*; F22D *1/02*
U.S. Cl. 122—20 B **8 Claims**



1. Apparatus for recovering energy from a smoke flue of a furnace and for heating water therewith, said apparatus adapted for interposition in said flue between said furnace and a chimney such that said apparatus is in gaseous communication with said flue, said apparatus comprising;

a tank with an interior for containing a volume of water;

a water inlet for providing water to said tank;

a water outlet for removing water from said tank;

heat exchanging means comprising a heat exchanging tube extending through the interior of said tank, said tube having a pair of ends and an outer surface, an inside diameter, and sufficient length that said pair of ends communicate with opposite exterior surfaces of the tank or extend outwardly beyond said surfaces;

a sleeve with an outside diameter slightly smaller than said inside diameter of the tube such that said sleeve is positionable within said tube and is concentric in relation thereto, said sleeve being sealed to said tube at the ends of said tube in a manner exterior to said tank thereby defining an annular air space between said tube and said sleeve,

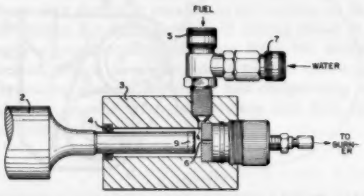
said sleeve adapted to communicate with said smoke flue between said furnace and said chimney with said heat exchanging means transferring some of the heat in the smoke flue to said water thereby heating said water while avoiding moisture condensation and soot build-up in said sleeve.

4,048,963

COMBUSTION METHOD COMPRISING BURNING AN INTIMATE EMULSION OF FUEL AND WATER

Eric Charles Cottell, P.O. Box 1415, Bayville, Long Island, N.Y. 11709

Continuation-in-part of Ser. No. 489,710, July 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 280,967, Aug. 16, 1972, abandoned, which is a division of Ser. No. 122,632, March 1, 1971, Pat. No. 3,749,318. This application May 21, 1975, Ser. No. 579,399
Int. Cl.[2] F02D *19/00*
U.S. Cl. 123—25 R **5 Claims**



1. A process of burning liquid fuel comprising, in combination, generating sonic vibrations, amplifying the energy density thereof by acoustic transformation which distributes the sonic power over a reduced area providing a narrow restrictive zone at the point of amplifying sonic energy density, the restricted zone being between the end of the acoustic transformer, which effects the acoustic transformation, and a stationary element which acts as an anvil, introducing water and liquid fuel in a thin film in said restricted zone whereby the water and oil are subjected to the sonic vibration of amplified energy density and whereby a water-in-oil emulsion of fine particle size is produced, the water being in the range of 10% to 50% of the total fuel and water, and burning said emulsion.

4,048,964

FUEL METERING APPARATUS AND METHOD

William Ronald Kissel, Milford, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed July 24, 1975, Ser. No. 599,243
Int. Cl.[2] F02B *3/00*; F02M *39/00*
U.S. Cl. 123—32 ED **47 Claims**

1. In a closed loop regulated fuel metering system for supplying a quantity of fuel for combustion with the air ingested by an internal combustion engine and maintaining a scheduled

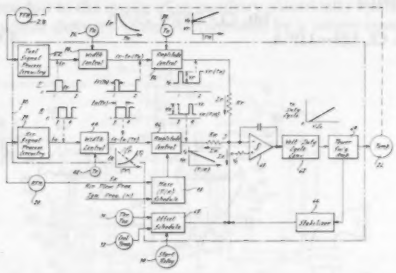
mass ratio between the fuel and air both supplied in fluid form to the engine, said system comprising in combination,

means for sensing a selected set of ambient parameters which affect the mass flow of at least one of said fluids,

mass fuel-air ratio scheduling means responsive to at least one mode of engine operation and providing an output signal representative of a desired mass fuel-air ratio for that mode of operation of the engine,

means for sensing the air supplied to the engine and generating a pulsatory electrical signal whose pulse repetition rate characteristic varies with the volumetric flow rate thereof,

means for sensing the fuel supplied to the engine and generating a pulsatory electrical signal having a pulse repetition rate characteristic which varies with the volumetric flow rate thereof,



means for modifying a pulse characteristic of one of said pulsatory fluid flow signals in accordance with a function of said desired mass fuel-air ratio representative signal from said mass fuel-air ratio scheduling means,

correction means for additionally modifying a pulse characteristic of one of said pulsatory fluid flow signals in accordance with at least one ambient parameter of said set of ambient parameters, and

control means responsive to and electrically combining said fluid flow signals as modified by said scheduled mass fuel-air ratio signal and by said correction means for controlling the mass flow of fuel ralative to the air into the engine in accordance with a predetermined relationship between said fluid flow signals that will maintain the actual mass flow of fuel supplied to the engine relative to the air ingested thereby in correspondence with the desired mass fuel-air ratio scheduled by said mass fuel-air ratio scheduling means.

4,048,965

APPARATUS FOR DETERMINING THE FUEL INJECTION QUANTITY IN MIXTURE COMPRESSING INTERNAL COMBUSTION ENGINES

Valerio Bianchi, Hochdorf; Reinhard Latsch, Vaihingen, and Peter Schmidt, Schwieberdingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 5, 1975, Ser. No. 638,267

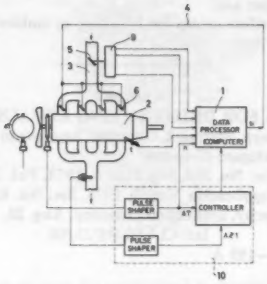
Claims priority, application Germany, Dec. 5, 1974, 2457461

Int. Cl.² F02D *5/00*

U.S. Cl. 123—32 EA **13 Claims**

1. In an apparatus for controlling the operation of an internal combustion engine including determination of the fuel injection quantity, said internal combustion engine including cylinders defining combustion chambers and injection valves for injecting fuel into said combustion chambers, said fuel being injected in dependence on throttle valve position and engine r.p.m. and being controlled by controlling the injection duration of said fuel injection valves on the basis of characteristic engine data, said apparatus including a system clock for providing master timing signals and a digital arithmetic circuit including a read-only memory in which said characteristic engine data is stored, first transducer means for providing a first digital datum corresponding to throttle valve position and second transducer means for providing a second digital datum corresponding to engine r.p.m., means for feeding the most significant bits (MSB) of the instantaneous values of said first and second digital datum to said read-only memory thereby selecting a digital word contained in said read-only memory, the improvement comprising:

said digital arithmetic circuit includes a shift register connected behind said read-only memory, for adding selected



data from said read-only memory and for transmitting it in serial bit form to a subsequent accumulator circuit, and further includes a 1-bit full adder circuit the input of which is connected to the outputs of said shift register and said accumulator and the output of which is connected to the input of said accumulator; whereby

said digital arithmetic circuit performs the generation of a weighted average of a number of said digital words from said read-only memory.

4,048,966

VACUUM ADVANCE CONTROL SYSTEM

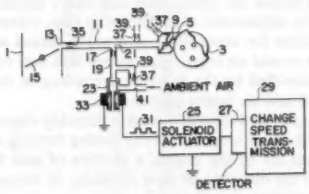
Masanori Harada, Yokohama; Shinzo Katou, Sagamihara, and Nobuyuki Hayashi, Yokosuka, all of Japan, assignors to Nissan Motor Company, Yokohama, Japan

Filed July 15, 1975, Ser. No. 596,193

Claims priority, application Japan, July 29, 1974, 49-90201[U]

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 A **9 Claims**



1. In an internal combustion engine having a carburetor with a spark port above the idle speed position of the throttle valve,

a distributor breaker plate spring biased to a retarded spark timing setting position;

vacuum servo means having a vacuum chamber for moving said distributor breaker plate in an advanced spark timing direction in response to vacuum in said vacuum chamber;

a vacuum line connecting said vacuum chamber to said spark port, said vacuum line having a first orifice therein adjacent said spark port;

a conduit having one end opening to the interior of said vcuum line at a position between said first orifice and said vacuum chamber of said vacuum servo means and other

end opening to the atmosphere, said conduit having a second orifice therein;

solenoid valve means normally closing said conduit at a position intermediate said second orifice and said other end of said conduit, said solenoid valve means being operative upon energization thereof to open said conduit to bleed an ambient air into said vacuum line through said conduit;

means for cyclically energizing said solenoid valve means during a predetermined range of operating conditions of the engine; and

air bleed orifice means for bleeding an ambient air into said vacuum line.

4,048,967

SYSTEM FOR DETOXICATING EXHAUST GASES

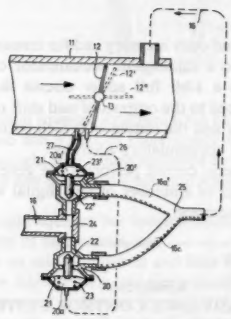
Gerhard Stumpp, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Division of Ser. No. 366,260, June 4, 1973, Pat. No. 3,954,091. This application Nov. 3, 1975, Ser. No. 628,382

Claims priority, application Germany, Aug. 25, 1972, 2241935

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **3 Claims**



1. In a system for detoxicating exhaust gases in an internal combustion engine, having air intake pipe means and conduit means for recycling a part of the exhaust gases of said engine into said air intake pipe means, the improvement comprising, in combination, valve means for controlling the flow of said part of the exhaust gases being thus recycled, throttle means comprising a flap and being associated with said air intake pipe means, and means for controlling said valve means in dependence on the adjustment of said throttle flap, wherein

i. said means for controlling said valve means are so connected to said air intake pipe means that said valve means are controlled by the pressure prevailing in the adjacent zone of said air intake pipe means;

ii. said flap of said throttle means is turnably disposed in said air intake pipe means whereby during turning of said flap to admit air to the engine a portion of said flap moves against the direction of flow of intake air through said air intake pipe means;

iii. said valve means comprise pneumatically operating valve means being closed in non-actuated position, and a control conduit from said air intake pipe means to said valve means for having the air pressure in the former act on the latter, which conduit opens into said air intake means upstream of the flap of said throttle means and upstream of that portion of said flap which moves against the direction of intake air flow, but still within the immediate vicinity of the latter flap portion, whereby, at almost closed flap during idling of the engine, and also during wide open flap position during full load operation of the engine, said pneumatically operating valve means remain closed; and

iv. said pneumatically operating valve means comprise two valves controllable independently of one another and interposed in parallel in said exhaust gas recycling conduit means and two control conduits, one of said control conduits leading from one of said valves to said air intake pipe means and opening in the latter upstream of said throttle means, and the other control conduit leading from the other valve to said air intake pipe means and opening in the latter upstream of the opening of the former control conduit thereinto.

4,048,968

EXHAUST GAS RECIRCULATION SYSTEM

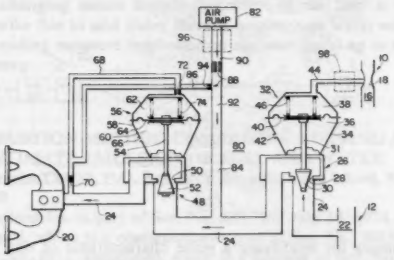
Syuniti Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed July 15, 1976, Ser. No. 705,436

Claims priority, application Japan, July 17, 1975, 50-99314[U]

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **4 Claims**



1. An exhaust gas recirculation system for an internal combustion engine including an intake passageway having a throttle valve rotatably mounted therein, said system comprising an exhaust gas recirculation (EGR) passage for feeding exhaust gases of the engine into the intake passageway downstream of the throttle valve, a first exhaust gas recirculation (EGR) control valve disposed in said EGR passage, a first actuator operable in response to a vacuum representative of the amount of air drawn through the intake passageway to cause said first EGR control valve to meter the amount of the engine exhaust gases fed into the intake passageway to a predetermined ratio to the amount of said air, a second exhaust gas recirculation (EGR) control valve disposed in said EGR passage downstream of said first EGR control valve, a second actuator operable in response to the vacuum in the intake passageway downstream of the throttle valve and the pressure in said EGR passage between said first and second EGR control valves to cause said second EGR control valve to maintain the pressure differential of parts of said EGR passage upstream and downstream of said first EGR control valve at a predetermined value, passage means to communicate and EGR passage between said first and second EGR control valves with said second actuator, and control means for limiting the amount of the engine exhaust gases passing in said passage means to prevent said passage means from being clogged by the engine exhaust gases.

4,048,969

FUEL VAPORIZER APPARATUS

D. Edward Widman, Roberts Road, Sauquoit, N.Y. 13456

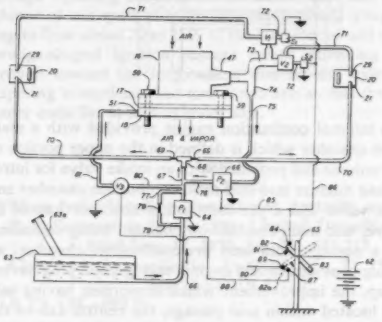
Filed June 24, 1976, Ser. No. 699,576

Int. Cl.[2] F02M *31/00, 17/18*

U.S. Cl. 123—133 **5 Claims**

1. An internal combustion engine having intake and exhaust manifolds, a gasoline tank, ignition means including an ignition switch and a battery, an L.P. gas carburetor, the L.P. gas carburetor having an air intake and being mounted on a base plate having a carburetor bore connecting the L.P. gas carburetor discharge passage with the engine intake manifold, the

base plate having jet means for spraying gasoline into the bore, the engine having heat exchanger means associated with its exhaust manifold for heating gasoline passing to the carburetor to a high temperature for breaking down the gasoline to a hot vapor in which heavy molecules are broken down into lighter molecules, the engine having a cam driven fuel pump for supplying gasoline to a delivery conduit to two passages, the first passage supplying gasoline to the base plate carburetor bore through first normally closed electrically-operated shutoff valve means, the second passage supplying fuel to the carburetor through the heat exchanger and through second normally closed electrically-operated shutoff valve means, the conduit from the heat exchanger to the carburetor being the hot gas conduit and having a sump adjacent its entrance to the caburetor for collecting gasoline condensed during its passage through the hot gas conduit, the sump being connected by a drain conduit to the intake of an auxiliary electrically operated pump whose delivery outlet is connected by a return conduit



to the delivery conduit, the delivery conduit is connected to a by-pass conduit having a metering passage for the slow return of gasoline boiled in the hot gas conduit to the gasoline supply tank for the engine when the engine is turned off, switch means associated with the ignition switch of the engine has two alternative positions in which the movable contact of the switch is first in contact with a first fixed contact for supplying electric current from the engine battery to the first normally closed electrically operated shutoff valve means, and a second fixed contact for supplying electric current to the second shutoff valve means and to the auxiliary pump, whereby the engine is started and the movable contact is held in contact with the first fixed contact for shutting off the flow of fuel through the heat exchanger means and the hot gas conduit to the carburetor for about one minute, and then when the heat exchanger means is warmed, the movable contact is moved to contact with the second fixed contact for shutting off the flow of fuel to the base plate and starting flow of fuel through the hot gas conduit and starting the auxiliary pump.

4,048,970

FUEL INJECTOR

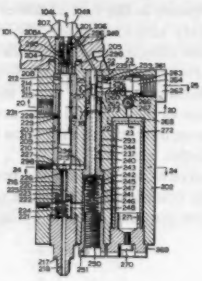
William Maurice Bard Fitzgerald, R.R. No. 1, Claremont, Ontario, Canada

Division of Ser. No. 305,453, Nov. 10, 1972, Pat. No. 3,841,797. This application Sept. 9, 1974, Ser. No. 504,728

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 AJ **13 Claims**

1. A fuel injector for an internal combustion engine of a compression ignition type, comprising in combination: a fuel injection nozzle, a valve-controlled fuel supply chamber located behind the injection nozzle for storing a quantity of fuel, a port for admitting fuel to the supply chamber, a fuel piston operating in the supply chamber for compressing the fuel stored therein and expelling the fuel therefrom via the injection nozzle, a supply of pressurized hydraulic fluid, and hydraulic actuator means responsive to engine cylinder pressure for actuating the fuel piston, the actuator means including a spring-loaded shuttle valve arranged to reciprocate between two limit positions in accordance with cyclical variations of gas pressure in the engine cylinder, and pumping means for controlling the supply of pressurized hydraulic fluid to actuate the fuel piston in accordance with the position of the shuttle valve, the spring-loaded shuttle valve being slidable in a valve



cylinder having an inlet for pressurized hydraulic fluid and an outlet communicating with the fuel piston, said pumping means comprising a reciprocatory free piston operating in a cylinder providing a pump chamber communicating with said valve cylinder, said pump chamber being connected to said inlet in one limit position of the shuttle valve and being connected to said outlet in the other limit position of the shuttle valve.

4,048,971

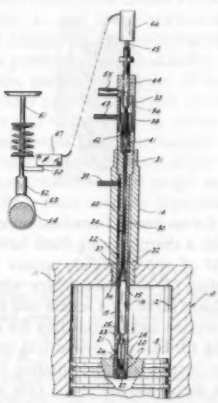
FUEL INJECTION SYSTEM

Donald H. Pritchett, 17 Rosewood, Rte. 2, Collinsville, Ill. 62234

Filed Apr. 15, 1976, Ser. No. 677,507

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 R **5 Claims**



1. In a fuel injection system for an internal combustion engine having a head and a cylinder, and having a piston reciprocatively mounted in the cylinder:

a. a ram fixed to and movable with the piston, the ram being provided with a fuel compression chamber having a fuel injection port communicating with the cylinder,

b. a first valve means in the ram normally closed to preclude flow through the injection port,

c. a tubular stem telescopically and slidably related to the ram,

d. a second valve means located in the tubular stem and

interconnecting the tubular stem and ram chamber for regulating fuel flow therebetween,

e. a fuel inlet means for introducing fuel into the tubular stem at one side of the second valve means,

f. actuating means operatively connected to the second valve means for opening the second valve means every second expansion of the ram chamber and permitting fuel to flow from the tubular stem into the ram chamber under suction pressure in the ram chamber as the ram and stem are relatively extended when the ram moves with the piston in one direction in the cylinder, and for closing the second valve means and compressing the fuel in the ram chamber between the first valve means and the second valve means as the ram and stem are relatively retracted when the ram moves with the piston in the other direction in the cylinder, and

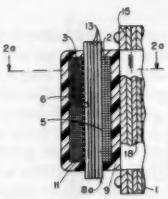
g. the first valve means opening at a predetermined pressure to eject the compressed fuel in the ram chamber through the injection port and into the cylinder.

4,048,972

IGNITION COIL FOR INTERNAL COMBUSTION ENGINES

Paul Wörz, Schwieberdingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 1, 1975, Ser. No. 618,556
Claims priority, application Germany, Oct. 12, 1974, 2448768
Int. Cl.² F02P *7/00*
U.S. Cl. 123—148 D **11 Claims**



1. Ignition coil for an internal combustion engine providing ignition pulses with a sharply rising flank having

an iron core (**1**) of approximately square cross section, a primary winding (**2**) and a secondary winding (**3**);

one of the windings (**2**) being a square coil of approximately square cross section and surrounding the iron core (**1**), the other winding (**3**) being a cylindrical coil of essentially circular cross section and surrounding the first winding (**2**) so that a sector-shaped space (**10**) will be included between the outer circumference of the first, square cross section winding and the second, circular cross section winding;

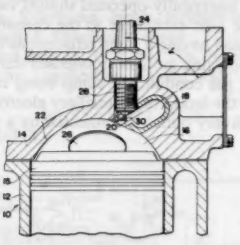
and an insert of magnetic material (**8***a*, **8***b*, **8***c*, **8***d*) located within said essentially sector-shaped space (**10**), between the primary (**2**) and the secondary (**3**) windings and essentially filling the space (**10**) between the windings, said magnetic insert forming a magnetic shunt with respect to the core to modify the wave form of pulses induced in the secondary winding (**3**) upon interruption of current flow through the primary winding (**2**) and providing pulses having a sharply rising flank.

4,048,973

INTERNAL COMBUSTION ENGINE PROVIDED WITH PRE-COMBUSTION CHAMBER

Shoogo Sanda, Okazaki, and Norihiko Nakamura, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Dec. 19, 1974, Ser. No. 534,486
Claims priority, application Japan, Feb. 21, 1974, 49-20102
Int. Cl.² F02B *23/00, 75/02*
U.S. Cl. 123—191 SP **3 Claims**



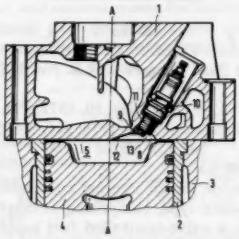
1. In an internal combustion engine provided with a main combustion chamber which is defined in the upper portion of a cylinder volume and provided with an intake valve for introducing a lean mixture into said main combustion chamber and an exhaust valve and a pre-combustion chamber free of an intake valve, said main combustion chamber being communicated by a passage with said pre-combustion chamber, an ignition plug provided in said engine, said ignition plug having a spark gap, the improvement which comprises; having said spark gap located within said passage, the central axis of the passage being off-set relative to the longitudinal central axis of the pre-combustion chamber so that the longitudinal central axis of the pre-combustion chamber is asymmetrical with respect to the longitudinal central axis of the passage, whereby said lean mixture pressed into said pre-combustion chamber through said passage is ignited by said spark plug, and blowing as a torch flame from said pre-combustion chamber into said main combustion chamber.

4,048,974

EXTERNALLY IGNITED FOUR CYCLE GAS ENGINE

Hans Seifert; Kurt Will, both of Augsburg, and Horst Zapf, Steppach, all of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg AG, Nurnberg, Germany

Filed Mar. 22, 1976, Ser. No. 669,266
Claims priority, application Germany, Mar. 20, 1975, 2512218
Int. Cl.² F02B *23/00*
U.S. Cl. 123—191 M **7 Claims**



1. An external auto-ignited four stroke cycle gas engine which includes: a cylinder, a piston reciprocable in said cylinder, a piston head mounted on and connected to said cylinder, said piston having that end thereof which faces said cylinder

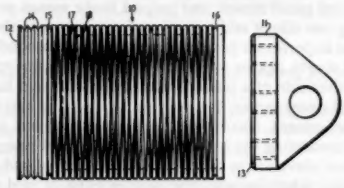
head provided with a truncated cone-shaped combustion chamber having a substantially flat bottom and widening and opening toward said cylinder head and being adapted in the upper dead center position of said piston to take in nearly the total gas-air mixture supplied per cycle to said cylinder, said cylinder head being provided with inlet valve means for admission of a gas-air mixture, means provided in said cylinder for imparting turbulence upon the gas-air mixture being admitted through said inlet valve means, said cylinder head also being provided with a truncated cone-shaped trough arranged completely in said cylinder head and communicating with said combustion chamber, a spark plug provided with a connecting thread and extending into said trough, the greatest diameter of said combustion chamber amounting to from about 55 to 70% of the diameter of said piston, and the depth of said combustion chamber equalling from about 15 to 20% of the diameter of said piston while the mantle surface of said combustion chamber is inclined at an angle of from 10° to 30° relative to the longitudinal axis of said cylinder, the greatest diameter of said trough equalling about twice the diameter of said connecting thread of said spark plug, and the depth of said trough amounting to from about 20 to 25% of the diameter of said trough, and wedge-shaped ignition passage means extending from said trough toward the longitudinal axis of said cylinder while tapering toward said last mentioned axis so that the tip of said taper ends flat at said cylinder axis.

4,048,975

PISTONS

William James Urquhart, Tumbi Umbi, Australia, assignor to F. B. J. Engineering Services Pty. Limited, Granville, Australia

Filed Nov. 12, 1975, Ser. No. 631,213
Claims priority, application Australia, Nov. 13, 1974, 75328
Int. Cl.² F01B *31/10*
U.S. Cl. 123—193 P **1 Claim**



1. A piston for use in an internal combustion engine or compressor without piston rings, said piston having as a sealing means a pair of circumferential grooves formed in the external surface of the piston, said grooves being spaced apart axially and being interconnected by right and left hand intersecting helical channels formed on the external surface of the piston, said grooves and channels being adapted to trap and retain lubricating oil, and a plurality of grooves in a plane perpendicular to the axis of the piston separated by at least one land having a sharp apex formed in the external surface of the piston, provided at one end of said piston wherein the diameter of the piston at the apex being substantially the same as the maximum diameter of the piston between the pair of grooves.

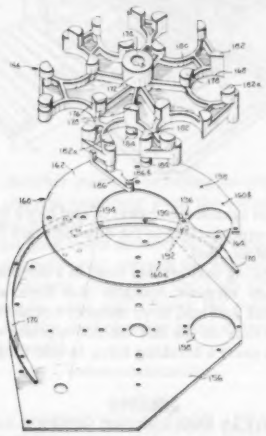
4,048,976

MAGAZINE ASSEMBLY FOR TOURNAMENT TRAP

James Marion Alday, Williamson, and Kenneth Charles Rowlands, Utica, both of N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Division of Ser. No. 586,207, June 12, 1975, Pat. No. 4,005,695, which is a division of Ser. No. 417,185, Nov. 19, 1973, Pat. No. 3,937,204. This application Feb. 13, 1976, Ser. No. 657,884
Int. Cl.² F41C *25/00*; F41B *3/04*
U.S. Cl. 124—47 **2 Claims**

1. In an apparatus for feeding targets on to a launching platform of a target throwing trap means, a magazine assembly positioned above said trap means, said assembly comprising a stationary frame member, means attaching said frame member to said trap means, a rotatable member having means thereon to position a number of columns of targets, means for rotating said rotatable member in predetermined increments, a stationary floor plate located beneath said rotatable member, said floor plate having an upper portion and a lower portion displaced thereof a distance equal to the height of one target, a ramp connecting said upper and lower portions, an opening in said lower portion through which a target can be dropped onto said launching platform, means on said rotatable member for gripping the lowermost target of each column of targets thus preventing each column from dropping by its own weight, a



continuous cam means beginning just ahead of and terminating just after said ramp for disengaging said target gripping means to permit the weight of an associated column of targets to be borne by the ramp which with further rotation then lowers the column gradually to said lower portion of said floor plate whereupon the column has descended a height of one target, said cam means positioned over said lower portion and terminating before the associated column of targets reaches said opening in the floor plate so that upon moving past the end of said cam means said target gripping means engages and supports the second target from the bottom of the column of targets, Whereupon further rotation of the rotatable member results in the now-free lowermost target to drop through the opening in the floor plate onto the launching platform.

4,048,977

FLUTE BREAKER

Jimmie M. Jenkins, Rte. No. 3, Canton, Miss. 39046

Filed Jan. 19, 1976, Ser. No. 650,514
Int. Cl.² B28D *1/32*
U.S. Cl. 125—23 R **6 Claims**

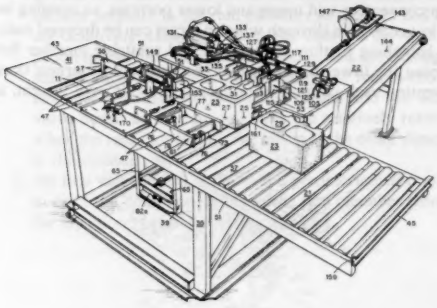
1. Apparatus for developing a decorative surface on a frangible building block having a flute extending at substantially a right angle to and outwardly from said surface of said block by breaking said flute from said block at a location inwardly of the distal end of said flute comprising

a breaker head including base means mounted for pivotal movement relative to said flute about a pivot located outwardly of and away from said flute, a rigid fulcrum member extending from said base means to a location on one side of said flute adjacent the position of the desired break of said flute, and an anvil member extending from said base to a location adjacent said distal end of said flute and on the opposite side of said flute as said fulcrum member, said fulcrum member and said anvil member being

immovable with respect to one another and defining an opening therebetween to receive said flute, the spacing between said fulcrum and anvil members being of a dimension greater than the corresponding dimension of the flute disposed therebetween,

means urging said flute on said block into a position between said fulcrum and anvil members while not placing absolute restraint against movement of said block in a direction generally perpendicular to the direction said flute extends from said block, and

means for rotating said breaker head in a direction whereby said fulcrum member contacts said flute adjacent the desired break and said anvil member contacts the distant end of said flute on the side thereof opposite said fulcrum member to exert a breaking force to said flute.



4,048,978

HEAT INSULATING SCREEN

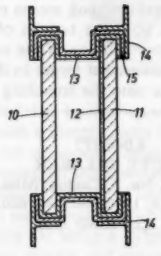
Emile Plumat, Gilly; Pol Baudin, Ransart; Robert Posset, Mont/S/Marchienne, and Jean-Marie Autequitte, Moustier/S/Sambre, all of Belgium, assignors to Glaverbel-Mecaniver, Brussels, Belgium

Continuation of Ser. No. 336,333, Feb. 27, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 569,937

Claims priority, application Luxembourg, Mar. 2, 1972, 64874

Int. Cl.² F23M *7/00*

U.S. Cl. 126—200 **21 Claims**



1. In an oven or furnace, the combination with a wall thereof having an opening therein of a heat insulating screen mounted in said opening, said heat insulating screen comprising two transparent sheets of glass or vitrocrystalline material disposed in facing relation to each other, the sheet which is directed toward the outside of the oven or furnace being chemically tempered, and the sheet which is directed toward the inside of the oven or furnace bearing an infrared screening coating wherein said infrared screening coating comprises an oxide or a mixture of oxides, at least one oxide selected from the group consisting of tin oxide and indium oxide, said coated sheet having a low energy transmission and a high energy reflection in the wavelength range of from about 0.8–15 microns.

4,048,979

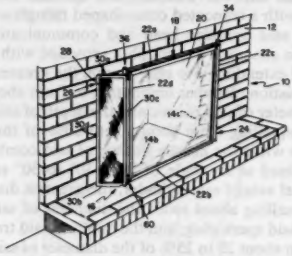
FUEL-SAVING FIREPLACE SCREEN UNIT

Jon D. LaVasseur, 12305-24th Ave. N., Minneapolis, Minn. 55441

Filed Mar. 1, 1976, Ser. No. 662,730

Int. Cl.² F24C *15/36*

U.S. Cl. 126—202 **8 Claims**



1. A portable fireplace screen unit comprising imperforate central panel means including a transparent glass pane, said panel means having a top, a bottom and opposite sides, the top being spaced sufficiently above the bottom and the sides spaced sufficiently apart so that said imperforate panel means will close the opening of a conventional fireplace when placed in a confronting position thereagainst, said bottom constituting an uninterrupted straight edge for contacting the hearth of a fireplace, first and second perforate wing panel means, each having a top, a bottom and opposite sides, first hinge means pivotally connecting one side of said perforate panel means to one side of said imperforate panel means so that said first perforate panel means can be freely pivoted into angular relationships to either side of a planar relationship with said imperforate central panel means, and second hinge means pivotally connecting one side of said second perforate means to the other side of said imperforate panel means so that said second perforate panel means can be freely pivoted into angular relationships to either side of a planar relationship with said imperforate central panel means, the bottoms of said first and second wing panel means also constituting uninterrupted straight edges for contacting the hearth of a fireplace and being at the same general elevation as the edge of the bottom of said central panel means, whereby with the bottom edge of said central panel means resting on said hearth both of said perforate panel means can be swung into angles extending toward the fireplace so as to maintain said imperforate panel means away from the fireplace to permit a substantial flow of air through the fireplace opening and swung into angles extending away from the fireplace so as to maintain said imperforate panel means in its said confronting position with the fireplace to prevent substantial flow of air through said opening.

4,048,980

SOLAR RADIATION ABSORBING MATERIAL

John M. Googin; Charles R. Schmitt; James M. Schreyer, all of Oak Ridge, and Harlan D. Whitehead, Clinton, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 8, 1976, Ser. No. 664,859

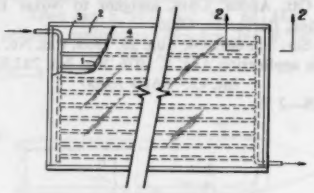
Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **10 Claims**

1. In a solar collector comprising in combination means for absorbing solar energy from incident solar radiation and means for conducting said energy to a heat transfer medium, the improvement wherein said means for absorbing solar energy is provided with a solar selective surface comprising carbon, said surface having a majority of external pores within the range of about 0.2–2 micrometers.

9. A method of providing a thermally conductive substrate

with a selective solar energy absorbing coating, said method comprising adhering a coating comprising carbon particles to



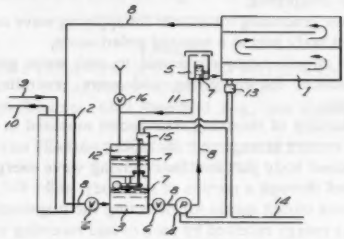
said surface, said carbon particles having a majority of external pores within the range of about 0.2–2 micrometers.

4,048,981

SOLAR HEATER

James C. Hobbs, II, 4384 Ingraham Highway, Miami, Fla. 33133

Filed Jan. 16, 1975, Ser. No. 541,417
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **13 Claims**



1. A system utilizing solar energy for heating purposes comprising:

a. a heat absorber to be exposed to sunlight and through which heat exchange liquid can flow, said absorber having an inlet for said liquid at one elevation and an outlet for said liquid at a higher elevation;

b. a liquid supply for the absorber, open to the atmosphere and communicating with the absorber inlet, said supply being at an elevation no higher than the elevation of the heat absorber inlet; and

c. a pump having an inlet operatively connected to the absorber outlet;

d. whereby liquid will be drawn through the absorber by the pump and be introduced to the absorber from the supply at no greater than atmospheric pressure.

4,048,982

BULB-TYPE SOLAR ENERGY COLLECTOR

Yu Kun Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

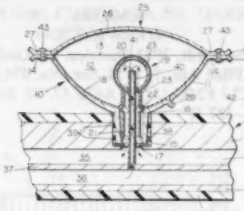
Filed May 3, 1976, Ser. No. 682,816
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **12 Claims**

1. A solar collector apparatus comprising an integral endless glass wall defining a parabolic surface disposed about a central focal axis, an aperture at one end of said wall centered on said axis at the apex of said parabolic surface, the opposite end of said wall defining an enlarged open end,

a continuous reflective coating layer over the parabolic surface of said wall for reflecting solar radiation striking said surface to said focal axis,

a hollow glass absorber member comprised of an enlarged bulbar end portion and an integral tubular stem portion depending therefrom that is open at one end, the stem of said member being inserted through said aperture and coaxial with said focal axis such that the open end thereof is disposed outside of said parabolic surface and adjacent the apex aperture,

fusion connecting means sealingly attaching said glass absorber member integrally with said parabolic glass wall at the apex aperture region thereof such that the bulbar end portion is disposed along said focal axis and within said parabolic surface,



said glass absorber member including an energy absorbing surface thereon extending over the surface area of the bulbar end portion thereof,

a transparent glass cover member for covering the open end of said parabolic wall opposite the aperture thereof, and

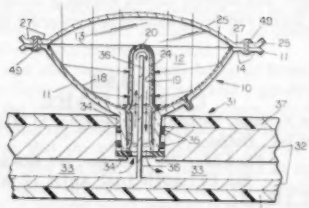
means for sealingly connecting the glass cover plate over said parabolic glass wall closing the parabolic chamber defined thereby, said chamber being evacuated to at least a partial vacuum.

4,048,983

SOLAR ENERGY COLLECTOR APPARATUS

Yu Kun Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 3, 1976, Ser. No. 682,817
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **18 Claims**



1. A solar collector apparatus comprising an integral endless glass wall defining a parabolic surface disposed about a central focal axis, an aperture at one end of said wall centered on said axis at the apex of said parabolic surface, the opposite end of said wall defining an enlarged open end,

a continuous reflective coating layer over the parabolic surface of said wall for reflecting solar radiation striking said surface to said focal axis,

a hollow, tubular glass member having a closed end and an opposite open end, said member being inserted through said aperture and coaxial with said focal axis such that the open end thereof is disposed adjacent the apex aperture,

connecting fusion means sealingly attaching said hollow tubular glass member integrally with said parabolic glass wall at the apex aperture region thereof,

said tubular glass member including an energy absorbing surface thereon extending over substantially the entire

surface area thereof disposed along the focal axis of said parabolic wall,

a transparent glass cover member for covering the open end of said parabolic wall opposite the aperture thereof, and

means for sealingly connecting the glass cover plate over said parabolic glass wall closing the parabolic chamber defined thereby, said chamber being evacuated to at least a partial vacuum.

4,048,984

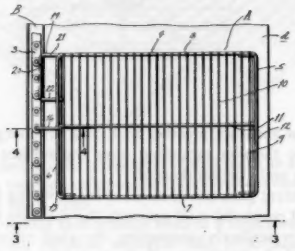
OVEN RACK

Timothy J. Eberhardt, 3932 Dunnica, St. Louis, Mo. 63116

Filed Apr. 7, 1976, Ser. No. 674,565

Int. Cl.[2] F24C *15/16;* **A47J** *37/00;* **A23L** *3/00*

U.S. Cl. 126—337 R **4 Claims**



1. For use with a tunnel type oven having an endless conveyor chain adapted for movement therethrough and with the courses of the latter being disposed in a horizontal plane, an oven rack comprising a frame, means provided on said frame defining a support for matter to be subjected to the oven, said frame having opposed or chain-adjacent and outer or chain-remote ends and opposed leading and trailing sides, an extension projecting from said frame's inner end, a finger depending from the outer end of said extension for detachably engaging said chain, guide means provided on said frame inner end forwardly of said extension for abuttingly engaging said chain to inhibit forward swinging of said rack during conveyance by said chain, and support surface engaging components secured to said frame and being located downwardly thereof.

4,048,985

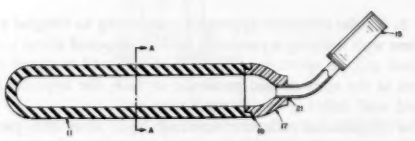
EXERCISE DEVICE

Howard A. Sasse, Buffalo, N.Y., assignor to H. Sass-E International Inc., Buffalo, N.Y.

Filed May 21, 1976, Ser. No. 688,936

Int. Cl.[2] A61B *5/00;* **A61H** *19/00*

U.S. Cl. 128—2 S **9 Claims**



1. An exercise device comprising in a single unit

a. an elongated tube member simulating a tumescent penis,

b. said tube member having a substantially circular outer cross-section, and having one rounded and enclosed and one open end,

c. a pressure indicating means positioned contiguous to, and in fluid tight relation to said open end of said tube member, forming a closed gas-containing system,

d. said pressure indicating means reflecting changes in pressure of said closed system.

4,048,986

INDIVIDUAL IDENTIFICATION AND DIAGNOSIS USING WAVE POLARIZATION

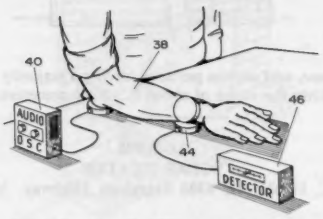
James H. Ott, Akron, Ohio, assignor to Novar Electronics Corporation, Barberton, Ohio

Division of Ser. No. 607,234, Aug. 25, 1975, Pat. No. 3,990,436.

This application Aug. 5, 1976, Ser. No. 712,038

Int. Cl.[2] A61B *10/00*

U.S. Cl. 128—2 R **1 Claim**



1. An apparatus for determining the polarization shift of wave energy transmitted through a portion of a body, the apparatus comprising:

a. a wave generating transducer for applying wave energy to a first body part at a selected polarization;

b. first circuit means connected to said wave generating transducer for energizing said wave generating transducer;

c. a plurality of receiving transducers mounted in side-by-side arcuate arrangement for at least partially surrounding a second body part and for receiving wave energy transmitted through a portion of said body; and

d. second circuit means for detecting the magnitude of the wave energy received by each of said receiving transducers.

4,048,987

SURGICAL ACID

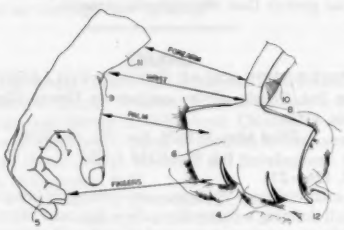
James Kevin Hurson, 14 Second St., Orangeville, Ontario, Canada

Filed July 26, 1974, Ser. No. 492,208

Claims priority, application United Kingdom, Aug. 6, 1973, 37278/73; Canada, June 28, 1974, 203740

Int. Cl.[2] A61B *17/02*

U.S. Cl. 128—20 **46 Claims**



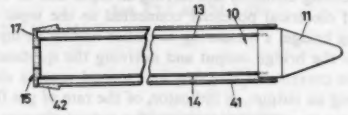
1. A surgical retractor comprising an elongated body of polymeric material having a polymeric surface which is non-toxic to cells and characterized in being three-dimensionally deformable merely by bending and without torsional deformation, with one end of said retractor fixedly secured at a point in space, into a full circle the plane of which may be in any angular orientation relative to said point in space.

4,048,988

SHUTTER FOR A RECTOSCOPE

Eberhard Regenbogen, Osnabruck, Germany, assignor to Richard Wolf GmbH, Knittlingen, Germany

Filed Jan. 8, 1976, Ser. No. 647,568
Claims priority, application Germany, Jan. 8, 1975, 002925
Int. Cl.² A61B 1/00
U.S. Cl. 128—4 **7 Claims**



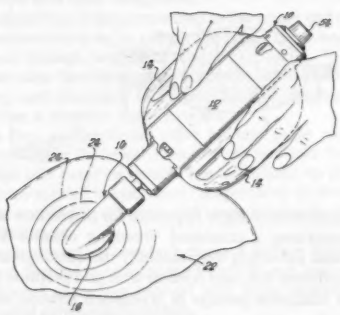
1. A shutter for a rectoscope instrument, comprising a bolt insertable into the anterior terminal cross section of a rectoscope tube, and a terminal part rigidly connected to the bolt, arranged at a distance corresponding approximately with the length of the rectoscope, characterized by the fact that the bolt (11, 19, 21, 31) is made from translucent material and connected by parallel elongated spaced rods, eccentric to the axis of the instrument thereby exposing a central visible cross section, to a terminal ring having an aperture therein affording an unobstructed view from the ring to the bolt.

4,048,989

TISSUE PULSATOR OPERATING WITH A TAPPING ACTION, AND METHOD

E. Lowell Schaefer, 6347 Deerfield Ave., San Gabriel, Calif. 91775

Filed Apr. 27, 1976, Ser. No. 680,760
Int. Cl.² A61H 23/00
U.S. Cl. 128—55 **4 Claims**



1. A tissue pulsator capable of operating on an area to be treated with a tapping action, said pulsator including a head having on one side thereof a surface engageable with the area to be treated, said head comprising an enlarged, laterally facing pad having said surface on one side thereof, said surface being convex in all directions, and said pulsator including a rotary eccentric drive means connected to said head for laterally moving said surface thereof inwardly and outwardly substantially parallel to itself so as to operate on the area to be treated with a tapping action, said rotary eccentric drive means including:

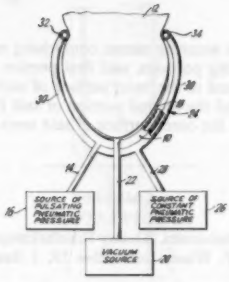
a. a housing providing a socket;
b. a shaft having inner and outer ends and having intermediate its inner and outer ends a ball disposed in said socket;
c. said head being connected to said outer end of said shaft;
d. a crank connected to said inner end of said shaft;
e. a rotary motor in said housing and substantially coaxial with said shaft and connected to said crank for rotating said crank substantially about the axis of said shaft so as to cause said outer end of said shaft to orbit, thereby laterally moving said surface of said head inwardly and outwardly substantially parallel to itself so as to operate on the area to be treated with a tapping action; and
f. means interconnecting said shaft and said housing for preventing rotation of said shaft about its axis.

4,048,990

HEART MASSAGE APPARATUS

Robert H. Goetz, 80 Vernon Drive, Scarsdale, N.Y. 10583

Filed Sept. 17, 1976, Ser. No. 724,456
Int. Cl.² A61H 7/00
U.S. Cl. 128—64 **6 Claims**



1. Apparatus for directly massaging a patient's heart, comprising:

a cup-like, inflatable bladder formed to surround a heart and operable to intermittently squeeze the heart in a massaging manner in response to the creation of predetermined pressure pulses within said bladder;

a collapsible, basket-like, bladder support means for disposing said bladder in an operational posture around the heart during a heart massaging operation, said support means being erectible into a generally rigid, bladder supporting condition and being collapsible to a non-rigid, pliable condition;

suction means for creating a predetermined vacuum in the generally annular space defined between said bladder and the heart when the bladder is disposed in an operational posture with respect to the heart; and

said bladder and said support means being so formed that upon the collapse of said bladder and said support means, and upon the release of said suction means, the overall heart massaging apparatus collapses into non-rigid, pliable condition so that the overall apparatus may be safely pulled from over the heart and out through an opening defined by a generally closed incision in the patient, such opening being several times smaller than the transverse thickness of said basket-like supporting means when said last mentioned means is erected in an operational posture.

4,048,991

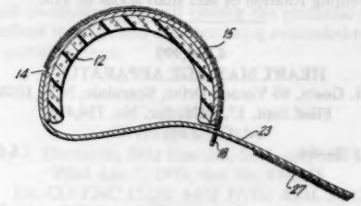
BRACE APPARATUS

Alvin J. Marx, 315 College Road, Bronx, N.Y. 10471

Continuation-in-part of Ser. No. 617,144, Sept. 26, 1975. This application Aug. 25, 1976, Ser. No. 717,483
The portion of the term of this patent subsequent to June 7, 1994, has been disclaimed.
Int. Cl.² A61F 13/00
U.S. Cl. 128—165 **8 Claims**

1. A brace adapted for application over a subject's wrist comprising an elongated semi-flexible curved backer sheet having a plurality of perspiration eliminating interstices therein, a porous perspiration passing inner sheet disposed about and secured to the inner surface of said backer means, said semi-flexible backer means being curved in a generally

rounded fashion, strap means attached to said semi-flexible curved backer sheet-inner sheet laminate about one end thereof, buckle means affixed to said semi-flexible backer sheet-inner sheet laminate about the other end thereof, said buckle means being adapted to receive the other end of said strap



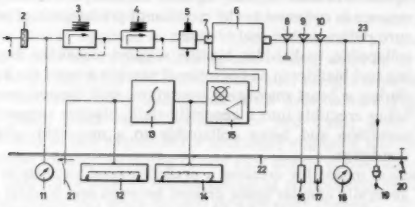
means, and brace securing means comprising mating first and second cooperating portions, said first portion of said mating means being affixed to the outer surface of said strap about its said other end and the second portion of said fastening means being secured to the outer surface of said semi-flexible backer sheet.

4,048,992

INSUFFLATOR

Hans-Joachim Lindemann, Kleiner Schaferkamp 43, 2 Hamburg 6, and Peter P. Wiest, Gothaallee 19, 1 Berlin 19, both of Germany

Filed Oct. 22, 1975, Ser. No. 624,845
Claims priority, application Germany, Oct. 26, 1974, 2451383
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—184 **4 Claims**



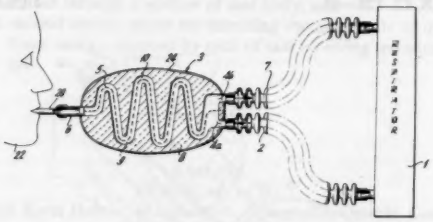
1. In an insufflator for introducing limited quantities of carbon dioxide into the human body for operational purposes, particularly for laparoscopy of the type including an inlet for connection to a source of carbon dioxide under pressure, an adapter connection for medical instruments, particularly, laparascopes and hysteroscopes, insertable in the human body, and pressure regulator means connected in series to the inlet and followed by a gas flow monitoring device, and through which, in series, the carbon dioxide is directed from the gas supply to the adapter connection, the improvement comprising, in combination, said pressure regulator means being constituted by two pressure regulators connected in series between said inlet and said flow-monitoring device and constantly adjusted to respective fixed gas supply pressures; said monitoring device comprising an expansion container having end and side walls with an inlet port located centrally of one end wall and an outlet port located centrally of the other end wall, the expansion container having a large cross-sectional area perpendicular to the flow direction therethrough, and having a peripheral zone spaced laterally from said inlet and outlet ports in which the gas flow velocity approaches a zero rate; sensing elements, providing currents corresponding to a measured variable of the gas flow, provided in said expansion container and including first sensing element located immediately in the area of said inlet port, and subjected to the gas flow, and a second sensing element located in said peripheral zone close to the side wall of said container at the maximum possible lateral spacing from said first element; a flow-directing cylindrical screen surrounding said first sensing element and shielding said second sensing element from the gas flow through said inlet port to said outlet port; a precision aperture, permanently adjusted to the maximum rate of flow, connected in series following said outlet port; an adjustable precision needle valve following said precision aperture; a pressure gauge connected to said adapter connection to indicate the back pressure at said adapter connection; a measuring bridge including said first and second sensing elements and having an input and an output; a source of electrical potential connected to the input of said measuring bridge; a measuring amplifier having an input connected to the bridge output and deriving the quotient of the respective currents of said first and second sensing elements, and having an output; an indicator, of the rate of gas flow per unit of time, connected to the amplifier output; the rate of flow being adjustable by said precision needle valve in accordance with the reading of said indicator; an integrator connected to the output of said amplifier; and a second indicator, for indicating the total gas flow, connected to said integrator, whereby the reading of said second indicator permits the drawing of a quantitative conclusion as to the size of the gas bubble in the human body.

4,048,993

HUMIDITY EXCHANGER IN AN APPARATUS FOR RESPIRATION AND ANASTHESIA

Gunter Dobritz, Lubeck, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

Filed May 28, 1976, Ser. No. 690,840
Claims priority, application Germany, June 30, 1975, 2529050
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—212 **7 Claims**



1. A humidity exchanger apparatus for respiration and anesthesia, comprising a combined breathing conduit having a partition wall extending longitudinally therethrough and comprising a diffusion foil, said conduit with said partition defining a separate inhalation passage in juxtaposed relation to a separate exhalation passage, a mouthpiece connected to said combined breathing conduit and interconnecting said passages adjacent one end, a respirator connection connected to said combined breathing conduit adjacent the opposite end and having a separate inhalation conduit connected to said inhalation passage and exhalation conduit connected to said exhalation passage and having valve means permitting inhalation air and exhalation air to pass in respective opposite directions through said inhalation and exhalation passages and conduits, and a first portion of said breathing conduit adjacent said one end of said breathing conduit defining a condensation zone, a second portion of said breathing conduit between said first portion and said opposite end defining a diffusion zone, and temperature control means to maintain said condensation zone of a predetermined length of said inhalation and exhalation conduit portions adjacent said one end at temperatures in which the air passing through said inhalation and exhalation conduit portions have a temperature difference in said condensation zone and also to maintain said diffusion zone of corresponding length of said inhalation and exhalation conduit

portions adjacent said opposite end at temperatures which are substantially equal.

4,048,994

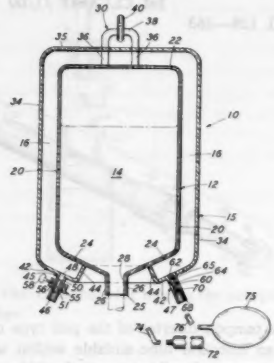
SELF-INFLATING LIQUID CONTAINER FOR KEEPING I.V. FLUID OR BLOOD PLASMA

Liu Ying P. Lo, 35-80 Central Ave., Oxford House, Apt. 104, Fort Meyers, Fla. 33901

Filed Aug. 24, 1976, Ser. No. 717,116

Int. Cl.² A61M 5/00

U.S. Cl. 128—214 F **4 Claims**



1. A self-inflating liquid container, comprising:

a. an inner flexible plastic receptacle for the retention of a liquid such as blood or the like,

b. a drain tube connected to the lower end of said inner receptacle, so as to permit the outward flow of the liquid from said inner receptacle,

c. supporting means connected to the upper end of said inner receptacle so as to permit the liquid contained therein to exit through said drain tube,

d. an outer flexible plastic receptacle substantially surrounding and enclosing said inner flexible receptacle so as to form a chamber therebetween,

e. a first unidirectional valve on said outer receptacle for permitting the inward flow of gas into said chamber such that said outer receptacle can be inflated, so as to obtain a force applied to said inner receptacle to air in the outward flow of the liquid from said inner receptacle through said drain tube,

f. said supporting means includes a hanger fastened at one end thereof to said inner receptacle and having a portion thereof extending beyond said outer receptacle and in sealed relationship thereto,

g. said chamber is initially at or below atmospheric pressure and is inflated by the flow of gas therein to apply a compressive force to said inner receptacle,

h. a second unidirectional valve on said outer receptacle for permitting the inward flow of gas into said chamber,

i. said inner receptacle includes:

1. a pair of inner spaced apart side walls,
2. a pair of inner spaced apart end walls,
3. an inner top wall,
4. an inner bottom wall all joined together with said drain tube extending outwardly therefrom, and

j. said outer receptacle includes:

5. a pair of spaced apart outer side walls in overlapping relationship to said inner side walls,
6. a pair of spaced apart outer end walls in overlapping relationship to said inner end walls,
7. an outer top wall extending in overlapping relationship to said inner top wall with said supporting means extending through said outer top wall, and
8. an outer bottom wall extending in partially overlapping relationship to said inner bottom wall and connected thereto by a peripheral terminal wall portion surrounding said outlet tube.

4,048,995

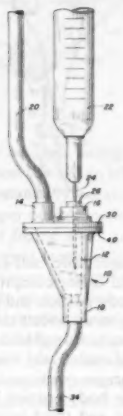
INJECTION SITE

Herbert Mittleman, Deerfield, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 605,170, Aug. 15, 1975, Pat. No. 4,000,740, which is a continuation of Ser. No. 475,215, May 31, 1974, abandoned. This application July 19, 1976, Ser. No. 706,363

Int. Cl.² A61M 5/14

U.S. Cl. 128—214 R **17 Claims**



1. An injection site for location between a parenteral source of fluid and a patient, which comprises: a first inlet to which a conduit from a first liquid container is adapted to be connected; a second inlet adapted to receive needle-injected medication; an outlet through which the combined first liquid and injected medication can flow with said outlet adapted for coupling to a conduit; a main body portion defining a single chamber that communicates with said first and second inlets and said outlet, said chamber having a sloped wall between said first inlet and said outlet, said chamber having a cross-sectional area adjacent said first and second inlets that is greater than the cross-sectional area of said chamber adjacent said outlet, said chamber having a cross-sectional area that is substantially greater than the cross-sectional area of said first inlet; said chamber having a length that is no greater than 1.5 inches to aid in preventing the medication that is injected from dropping through air; said second inlet and said outlet being substantially coaxial, whereby the needle is substantially prevented from piercing the chamber, and said chamber being constructed to provide unobstructed flow of the first liquid and medication to said outlet.

4,048,996

DUAL INJECTION SITE

Herbert Mittleman, Deerfield, and Joseph L. Schopen, Crystal Lake, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed June 14, 1976, Ser. No. 695,703

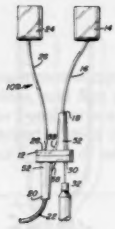
Int. Cl.² A61M 5/00

U.S. Cl. 128—214 R **23 Claims**

1. An injection site for location between a parenteral source of fluid and a patient, which comprises: a first inlet for coupling to a conduit from a first liquid container; a second inlet having a pierceable, self-sealing diaphragm positioned therein; a third inlet having a pierceable, self-sealing diaphragm positioned

therein; an outlet for coupling to a conduit for connection to a patient; and a main body portion having a chamber coupling said first, second and third inlets to said outlet, said first inlet and said outlet being oppositely positioned and said second and third inlets being oppositely positioned, said second inlet and said outlet being substantially coaxial, and said third inlet being substantially coaxial with said first inlet.

19. An injection site for location between a parenteral source of fluid and a patient, which comprises: a main body portion; a first inlet on one side of said body portion for coupling to a conduit from a first liquid container; a second inlet on said one side of said body portion, laterally displaced from said first



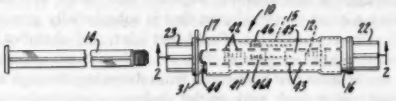
inlet, and having a pierceable, self-sealing diaphragm positioned therein and held under compression; an outlet on the opposite side of said body portion and laterally displaced from said inlet for coupling to a conduit connected to a patient, a third inlet on said opposite side of said body portion and laterally displaced from said outlet, said third inlet having a pierceable, self-sealing diaphragm positioned therein and held under compression; said main body portion having a chamber coupling said first, second and third inlets and said outlet, said second inlet being positioned for injection from said first side and said third inlet being positioned for injection from said opposite side.

4,048,997

SYRINGE WITH ACTINIC RADIATION PROTECTION

Srinivas T. Raghavachari, Chicago, and Robert L. Striebel, II, Evanston, both of Ill., assignors to MPL, Inc., Chicago, Ill.

Filed Nov. 1, 1976, Ser. No. 737,209
Int. Cl.² A61M 5/00
U.S. Cl. 128—215 **7 Claims**



1. A syringe-type dispenser for storing and dispensing a liquid which is adversely affected by exposure to actinic light, comprising:

a housing including a clear, transparent tube having an outlet at one end;

outlet seal means, at the outlet end of the housing, including means for opening an outlet passage through the housing outlet;

a piston in the other end of the tube, the outlet seal means and the piston conjointly defining a normally sealed chamber, within the tube, for storing the liquid to be dispensed, the piston being axially movable through the tube toward the outlet end of the housing to discharge the liquid through the outlet;

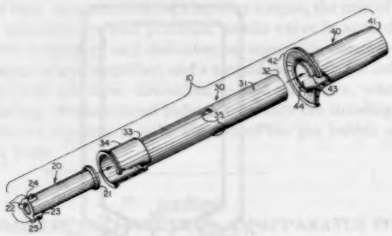
and a thin, protective film sheath, covering and tightly fitting over the outside of the housing throughout the length of the tube between the seal means and the piston, the protective film sheath being formed of a material which inhibits the transmission of actinic light but passes other light in the visible spectrum to permit limited inspection of the dispenser contents, at least a part of the sheath being readily detachable to expose the contents of the dispenser for improved inspection directly through the housing.

4,048,998

TAMPON INSERTER

Louis V. Nigro, Saugus, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Feb. 19, 1976, Ser. No. 659,489
Int. Cl.² A61F 15/00
U.S. Cl. 128—263 **6 Claims**



1. A tampon inserter of the pull type comprising an outer tube, an insertion tube slidable within said outer tube, and retainer means fixedly connected within said outer tube, said insertion tube including means permitting said retainer means to extend to the inside thereof while permitting free movement thereof, said insertion tube having a proximal end for insertion into a body cavity and adapted to contain a tampon between said proximal end and said retainer means, said retainer means so positioned that when said insertion tube is moved away from said body cavity, said retainer means engages said tampon to cause it to be deposited outside said tampon inserter in said body cavity.

4,048,999

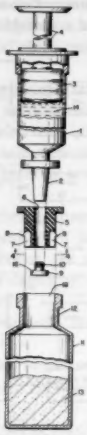
TWO-CHAMBER MIXING SYRINGE

Erich Kobel, Darmstadt, Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed July 12, 1976, Ser. No. 704,631
Claims priority, application Germany, July 24, 1975, 2533036; Oct. 17, 1975, 2546495
Int. Cl.² A61J 1/00
U.S. Cl. 128—272.1 **9 Claims**

1. A two-chamber syringe assembly for initially isolating a first liquid component to be provided in one chamber thereof from a second component to be provided in a second chamber thereof and thereafter mixing the two components; comprising a piston and cylinder type syringe having an axially-bored dispensing fitting at one end of the cylinder, with the cylinder forming a chamber for the liquid component when the piston is in outward retracted position at the opposite end of the cylinder; a container providing a second chamber for the second component and having an opening at one end; a first axially bored resilient stopper in the form of a sleeve, with one end thereof adapted for sealed engagement with the open end of the container and the bore thereof adapted to mounting the dispensing fitting of the cylinder therein in sealed engagement therewith at its other end; and a second stopper adapted to mounting in the bore of the first stopper below the dispending fitting in sealed engagement with the first stopper to seal off the piston cylinder chamber and included liquid component from the other component in the second chamber during storage and transport, the second stopper being ejectable from the

bore of the first stopper after mounting therein into the second chamber upon actuation of the piston inwardly of the cylinder



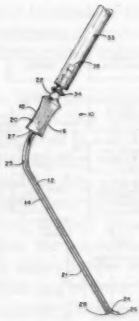
to communicate the two chambers for mixing the components in the second chamber.

4,049,000

SUCTION RETRACTION INSTRUMENT

Robert W. Williams, 3201 Maryland Parkway, Las Vegas, Nev. 89109

Filed Aug. 1, 1975, Ser. No. 601,058
Int. Cl.[2] A61M *1/06*
U.S. Cl. 128—276 12 Claims



1. A suction retraction instrument comprising:

an elongated hollow suction pipe having a suction port at its lower end and secured to a manifold at its upper end and having a straight lower portion extending along an axis, and

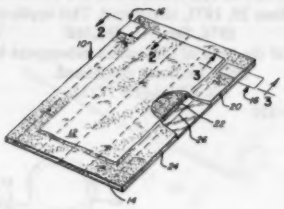
a unitary support rod and retractor arm secured along the length of said suction pipe, the retractor arm comprising the lower end of said support rod, and wherein said retractor arm extends beyond the lower end of said suction pipe and at an obtuse angle from said axis.

4,049,001

DIAPER WITH RESEALABLE TAPE CLOSURE

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 27, 1976, Ser. No. 661,920
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—287 2 Claims



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

a backing web, folded over to form first and second anchoring legs, each having an inner face and an outer face, and receiving a marginal portion of said diaper there-between, said inner face of said legs being provided with an adhesive coating by means of which said legs are permanently attached to said marginal portion, said first leg being attached to said diaper inside surface and said second leg being attached to said diaper outside surface;

a first securing tape ribbon having a fixed end and a free working end;

an adhesive coating on at least one face of said fixed end of said first securing tape ribbon by means of which said fixed end of said first securing tape ribbon is attached to said second leg to attach said fixed end to a marginal location of said diaper, and a pressure-sensitive adhesive coating on said one face of said free working end of said first securing tape ribbon;

a second securing tape ribbon having a fixed end and a grippable free working end, said fixed end of said second securing tape ribbon being coextensive with and adhesively but releasably attached to said adhesive-coated face of said free working end of said first securing tape ribbon and the free working end of said second securing tape ribbon extending beyond the free working end of said first securing tape ribbon, and a pressure-sensitive adhesive coating on said second securing ribbon on the face thereof opposite to the face attached to said free working end of said first securing tape ribbon; and

release means on said outer face of said first leg providing a release region facing in the same direction as said diaper inside surface;

said second securing tape ribbon being movable from a folded-over storage position in which said second securing tape ribbon is releasably adhered to said release region to a working position in which said adhesive-coated second securing tape ribbon is available for use in securing said diaper about said infant; and

said free working end of said first securing tape ribbon being separable from said fixed end of said second securing tape ribbon to enable said diaper to be removed from said infant and to make said pressure-sensitive adhesive coating on said free working end of said first securing tpe ribbon available for use in refastening said diaper about said infant.

4,049,002
FLUID CONVEYING SURGICAL INSTRUMENT

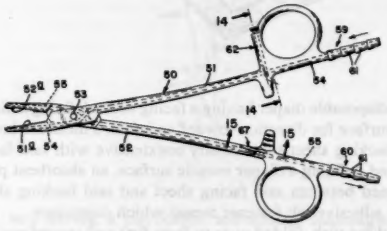
Harold D. Kletschka, Minneapolis, and Edson D. Rafferty, Excelsior, both of Minn., assignors to Bio-Medicus, Inc., Minnetonka, Minn.

Division of Ser. No. 597,095, July 18, 1975, Pat. No. 3,980,086, which is a continuation of Ser. No. 446,809, Feb. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 368,192, June 8, 1973, Pat. No. 3,807,406, which is a continuation of Ser. No. 156,825, June 25, 1971, abandoned. This application May 3, 1976, Ser. No. 682,386

The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.

Int. Cl.[2] A61B *17/32*

U.S. Cl. 128—318 10 Claims



1. A surgical instrument of scissors type configuration, comprising:

a. first and second elongated members of essentially the same length, each having a manipulating end and a functional end, said functional ends having opposed impermeable inner faces and distal outer faces, said inner faces being substantially adjacent each other in the closed position, the first and second elongated members being pivotally connected at an intermediate point and arranged so that the functional ends together provide a surgical function upon relative movement of said manipulating ends;

b. first and second fluid conduit means respectively associated with the first and second elongated members, each of said conduit means terminating in an opening in the distal outer face of the associated elongated member at the extreme functional end thereof;

c. said first fluid conduit means being adapted for connection to a source of negative fluid pressure;

d. and the second fluid conduit means being adapted for connection to a source of positive fluid pressure.

4,049,003
DIGITAL CARDIAC PACER

Robert A. Walters, Pittsburgh, and Steve A. Kolenik, Leechburg, both of Pa., assignors to ARCO Medical Products Company, Leechburg, Pa.

Continuation-in-part of Ser. No. 625,295, Oct. 23, 1975, abandoned. This application Feb. 2, 1976, Ser. No. 654,504

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—419 PG 6 Claims

1. A heart pacer for supplying stimulation pulses to electrodes adapted to be connected to a heart, comprising;

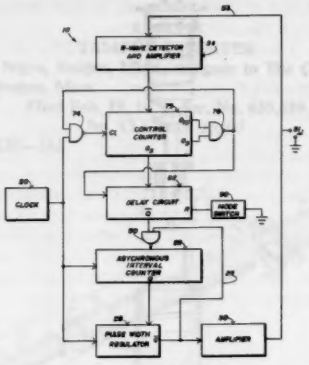
a source of clock pulses a plurality of which being spaced within an interval between normal heartbeats;

counting means for counting said clock pulses for producing an output upon reaching a pulse count corresponding to a predetermined interval within said interval between normal heartbeats, said counting means being reset upon reaching said count;

a stimulation pulse generator actuated by said counting means output to provide a stimulation pulse for delivery to said electrodes;

a detecting circuit for receiving signals from said electrodes for detecting and amplifying heartbeat indicative signals;

and control interval counting means for counting a preselected number of said clock pulses corresponding to a preselected refractory interval, said control interval counting means being reset by said heartbeat indicative signals, each control interval consisting of the sum of said refractory interval and a variable interval resulting from



said control interval counting means being reset by said heartbeat indicative signals, if any, detected prior to the reaching of the count corresponding to said refractory period, said control interval counting means thereafter generating an output when actuated by heartbeat indicative signals to disable and reset said counting means.

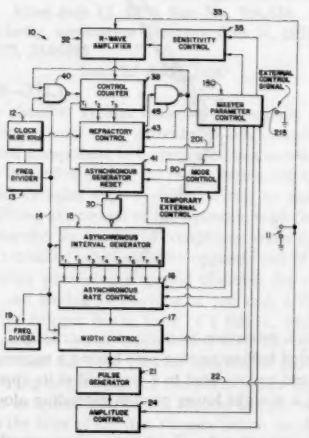
4,049,004
IMPLANTABLE DIGITAL CARDIAC PACER HAVING EXTERNALLY SELECTIBLE OPERATING PARAMETERS AND "ONE SHOT" DIGITAL PULSE GENERATOR FOR USE THEREIN

Robert A. Walters, Pittsburgh, Pa., assignor to ARCO Medical Products Company, Leechburg, Pa.

Continuation-in-part of Ser. No. 654,584, Feb. 2, 1976, which is a continuation-in-part of Ser. No. 625,295, Oct. 23, 1975, abandoned. This application Mar. 3, 1976, Ser. No. 663,372

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—419 PG 24 Claims



1. An implantable cardic pacer for connection to heart contacting electrodes comprising:

means for generating a plurality of clock pulses within a normal heartbeat interval;

triggerable means for generating a heart stimulation pule for delivery to said heart electrodes;

means for counting said clock pulses for a stimulation pulse interval to thereafter deliver a trigger signal to said stimulation pulse generating means;

means for counting said clock pules to a refractory interval count;

means for detecting signals upon the heart electrodes and for generating a signal in response thereto to reinitiate the count of said said refractory interval counting means;

means responsive to said detected heart electrode signal after said refractory interval count for resetting said stimulation counter;

means for independently adjusting the width of said stimulation pulse, the amplitude of said stimulation pulse, the refractory interval count, the stimulation pulse interval, the sensitivity of said detecting means, and the resetting of said stimulation counter;

means for receiving externally transmitted parameter control signals;

register means connected to said receiving means into which said parameter control signals are loaded prior to their execution;

memory means connected to receive signals from said register means for storing said parameter control signals for controlling said independent adjusting means;

means operative to load said parameter control signals into said memory means after said parameter control signals are loaded into said register means;

and means interconnecting said memory means to said adjusting means to execute the parameter control signals in said memory means, whereby said stimulation pulse width, stimulation pulse amplitude, refractory interval count, stimulation pulse interval, sensitivity of said detecting means and resetting of said stimulation counter are controlled by said parameter control signals.

19. For use in a digital heart pacer of the type which receives externally transmitted pulses, a "one shot" digital pulse generator for producing a pulse of controlled amplitude and width upon the application of said received pulse, comprising:

a source of digital "high" and "low" states;

a clock pulse generator;

first and second flip-flop means each having a data input terminal, an output terminal, an inverted output terminal, a clock terminal operable to produce a next state output in accordance with the present state input, and a reset terminal;

said received pulse being conducted to the clock input of said first flip-flop, said data input terminal of said first flip-flop being connected to a digital "high" state, and the output of said first flip-flop being connected to the data input of said second flip-flop, and additionally defining the output of said digital "one shot" generator;

counter means having a clock input and an output which changes state after the application of a predetermined number of clock pulses to the clock input, and a reset terminal to initialize said counter;

said counter being reset by the signal on the inverted output terminal of said first flip-flop, and providing a signal upon said output terminal to said clock terminal of said second flip-flop, said counter receiving clock pulses from a clock generator upon its clock input terminal;

the output from said second flip-flop being connected to reset said first and second flip-flops to an initial state;

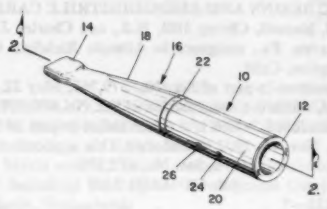
whereby upon the application of a received pulse to said first flip-flop, an output is presented upon its output terminals which is of predetermined amplitude, continuing until said first and second flip-flops are reset as controlled by the count output of said counter.

4,049,005

FILTERING APPARATUS FOR CIGARETTE SMOKERS

Armando C. Hernandez, 1582 Clear View Lane, Santa Ana, Calif. 92705, and Jack P. Prohoroff, 9736 Pettswood Drive, Huntington Beach, Calif. 92646

Filed May 17, 1976, Ser. No. 687,308
Int. Cl.[2] A24F *13/02*
U.S. Cl. 131—187 **5 Claims**



1. In a cigarette holder of the kind in which tars and nicotine components are to be precipitated out of the smoke and which holder includes a shank having a cigarette coupler at its smoke input end and a bit at its smoke outlet end and a flow path extending through the shank from the inlet at the coupler to the outlet at the bit, in combination:

means in said flow path for causing smoke traversing the flow path to be accelerated, change direction, and expand, in that order, at first, second and third successive positions, respectively, along said flow path;

means for introducing a quantity of ambient air into said flow path at said third position at which said smoke is made to expand; and

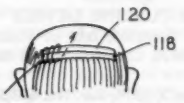
a second inlet for ambient air formed through the wall of said shank downstream from said coupler and upstream from said first of said positions.

4,049,006

HAIR-WEAVING DEVICE

Proxy G. Saunders, 9129 Phillips Ave., Chicago, Ill. 60617, and Lorine Moorman, 554 E. 92nd Place, both of Chicago, Ill. 62223

Filed May 10, 1976, Ser. No. 684,769
Int. Cl.[2] A41G *3/00*
U.S. Cl. 132—5 **10 Claims**



1. A hair-weaving machine for attaching a hairpiece having an endportion to a strand of hairs comprising:

first holding means for gripping and forcing a needle having a thread attached thereto through the end portion of said hairpiece past the strand of hairs, the needle being releasable from said first holding means upon having been forced through said endportion of said hairpiece and past the strand of hairs;

second holding means for gripping the needle upon the latter having been forced through said endportion of said hairpiece and past the strand of hairs, and for guiding the needle to said first holding means, the needle being releasable from said second holding means upon being in the vicinity of said first holding means and grippable by the latter upon release from said second holding means; and

thread-tension producing means for creating a tension in a needle-attached thread so that a tight loop of the thread is formed around at least part of said endportion of said

hairpiece and at least part of the strand of hairs upon the needle being forced through the endportion of said hairpiece and past the strand of hairs at least a second time.

4,049,007

PERMANENT WAVING OF HUMAN HAIR BY MEANS OF CROSSLINKING URETHANE AND/OR HYDROXAMATE DERIVED FROM REACTIVE ACRYLIC RESINS AND ADIPODINITRILE CARBONATE

Donald H. Russell, Cherry Hill, N.J., and Charles J. Kremer, Brookhaven, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 579,765, May 22, 1975, abandoned, which is a continuation of Ser. No. 400,099, Sept. 24, 1973, abandoned, which is a continuation-in-part of Ser. No. 307,281, Nov. 16, 1972, abandoned. This application Apr. 1, 1976, Ser. No. 672,578

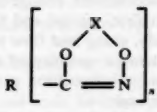
Int. Cl.² A45D *7/00*

U.S. Cl. 132—7 **34 Claims**

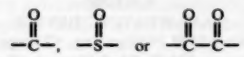
1. A composition useful for waving hair comprising

a. at least one hydroxyl, amine, or thiol group-containing acrylic or methacrylic film-forming resin having a number average molecular weight of about 500 to 500,000 or polyol, polyamine or polythiol resin forming precursor containing 1 to 30 carbon atoms,

b. a cyclic nitrile compound of the formula:



wherein R is an organic radical free of nucleophilic groups and having 1 to about 200,000 carbon atoms, X is a member selected from the group consisting of



and *n* is at least 2, and

c. a flexibilizing adhesion promoter.

4,049,008

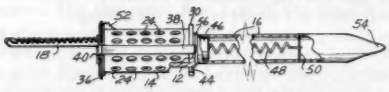
HAIR-CURLING DEVICE

Richard V. Brothers, deceased, late of Fontana, Calif., by Magdalena M. Brothers, executrix, 17388 Merrill, Fontana, Calif. 92335

Filed June 7, 1976, Ser. No. 693,339

Int. Cl.² A45D *1/00*

U.S. Cl. 132—33 B **2 Claims**



1. A hair-curling device comprising:

a substantially cylindrical spool-like body with a flange at each of its ends and having a longitudinal slot;

a sleeve-like member disposed about said body and turnable relative thereto for confining an end portion of a lock of hair between the member and the body after which the member and body are turnable as a unit for winding the lock of hair thereabout and forming it into a curl, said member being substantially cylindrical and having a longitudinal slot registrable with the slot in the body;

a hollow structure detachably mounting the body and having a slot registrable with the slots in the body and member;

comb means mounted for longitudinal movement in the hollow structure and disposable in the body, said comb means being extendable for engaging the lock of hair and combing it into a layer of substantially uniform thickness and retractable for disposing the free end portion of the combed lock of hair in the registered slots; and

curl holding means movably mounted on the body for engaging the combed lock of hair adjacent the scalp end portion after curling.

4,049,009

APPARATUS FOR TRIMMING THE NAILS

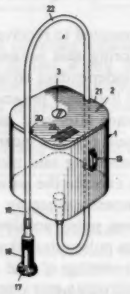
Florian Marchand, Rue la Golatte 1, 2738 Court, Berne, Switzerland

Filed Apr. 23, 1973, Ser. No. 353,412

Claims priority, application Switzerland, Apr. 27, 1972, 6285/72

Int. Cl.² A45D *29/04*

U.S. Cl. 132—76.4 **4 Claims**



1. An apparatus for trimming the nails, comprising a casing, an electric motor in said casing, a rotary shaft in said casing driven by said motor, a socket, a grinding-wheel mounted for rotary motion in said socket, a flexible wire connecting said rotary shaft to said grinding-wheel for driving said wheel together with said shaft, a sheath surrounding said wire, said sheath having one end secured to said casing and the other end connected to said socket, and grooves provided in the outer surface of said casing, said grooves having sizes adapted to said sheath in order to enable tightly fitting said sheath into said grroves upon winding said sheath and said wire around said casing without disconnecting said wire from said shaft, said casing having a front wall to which said sheath is connected, two opposed side walls on either side of said motor and being substantially parallel to the motor axis, and a rear wall, said grooves being provided in said opposed side walls in order that said sheath and said wire form a loop beyond said rear wall upon winding them around said casing, and said sheath being fitted in said grooves strongly enough in order that said loop constitutes a handle permitting the apparatus to be hung thereby.

4,049,010

FINGERNAIL CONDITIONING AND POLISHING METHOD AND APPARATUS

Bernard A. Mitchell, and Barry E. Shipp, both of Chicago, Ill., assignors to Jovan, Inc., Chicago, Ill.

Filed Mar. 10, 1976, Ser. No. 665,633

Int. Cl.² A45D *40/30*

U.S. Cl. 132—88.5 **14 Claims**

1. A method of conditioning and polishing fingernails or toenails comprising the steps of:

a. smoothing the surface of the nail by a delicate abrasion to

remove substantially all longitudinal ridges without locally wearing away part of the nail;

b. applying a conditioning cream over the smoothed surface of said nail, said conditioning cream comprising at least softeners, preservatives, and protein; and

c. buffing said cream and said nail.

4,049,011

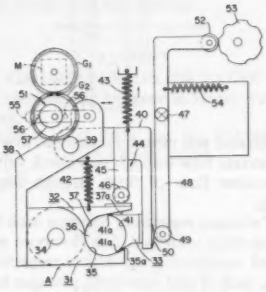
COIN STACKING DEVICE

Shiro Nakai, and Yoshio Nishikawa, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Filed Aug. 31, 1976, Ser. No. 719,382

Int. Cl.² G07D *9/06*

U.S. Cl. 133—1 A **2 Claims**



1. A coin stacking device comprising:

a first wall member having an arcuately recessed curved surface rotatably supported on a first pivot shaft which is fixed in space;

a second wall member having an arcuately recessed curved surface disposed contiguously to said curved surface of the first wall member to form therewith a continuous curved surface defining a substantially semicylindrical cavity, said second wall member being rotatably supported on the first pivot shaft and being biased to rotate about the first pivot point in the direction to widen the cavity;

a support lever rotatably supported at one end thereof by a second pivot shaft fixed to an extended part of the first wall member and biased to rotate about the second pivot point in the direction to separate the other end thereof away from said cavity;

a third wall member supported on said other end of the support lever, thereby being movable toward and away from said cavity, and having an arcuately recessed curved surface opposed to said cavity and forming therewith a continuous curved surface of substantially circular cross section which is of variable diameter and defines a cylindrical space for stacking of coins supplied thereinto;

a regulating device provided on the support lever and functioning to determine the angular position of the second wall member relative to the first wall member thereby to determine the degree of opening of the cavity; and

adjusting means adjustably operable to move the support arm thereby to adjustably vary the diameter of said cylindrical space to any selected one of a plurality of predetermined values corresponding to the diameters of different kinds of coins.

4,049,012

METHOD AND DEVICE FOR MEASURING AND KEEPING CONSTANT THE WATER CONTENT IN A SALT BATH

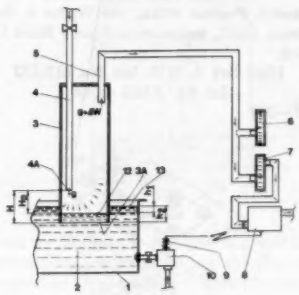
Johannes Maria van de Kooi, Montfoort, Netherlands, assignor to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

Filed Sept. 20, 1976, Ser. No. 724,917

Claims priority, application Netherlands, Sept. 22, 1975, 7511138

Int. Cl.² G05D *11/08*

U.S. Cl. 137—3 **14 Claims**



1. A method for measuring and keeping substantially constant the proportion of water in a salt bath, where the water vapor pressure over the bath corresponds to the proportion of water in the bath, comprising the steps: flowing a gas having a predetermined initial dew point toward and onto the surface of said salt bath, absorbing a quantity of water vapor from said salt bath with said gas and thereby changing the value of said dew point, measuring said change in value of the dew point, and supplying a selected quantity of water to said salt bath for returning the dew point of said bath back to the initial value thereof and thereby maintaining the water proportion of said bath.

4,049,013

SEWAGE SYSTEM

William Shenk, 8118 Oakleigh Road, Baltimore, Md. 21234

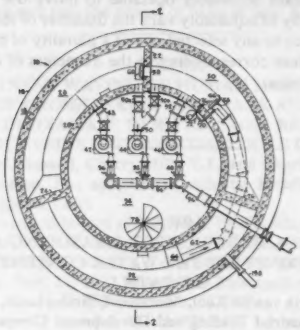
Filed Oct. 22, 1976, Ser. No. 734,725

Int. Cl.² F17C *3/00*

U.S. Cl. 137—263 **12 Claims**

1. In a sewage station having circular means for receiving sewage and pumping means powered for discharging sewage from the receiving means, the improvement comprising: the means for receiving including structure defining: a drywell, a plurality of wells in annular array around the drywell, means

for power-free distribution of sewage in predeterminable sequence among portions of the plurality of wells, and means for



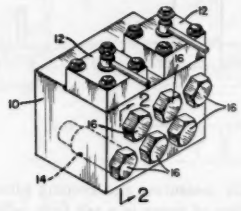
selectively delivering sewage to the pumping means from the plurality of wells in predeterminable sequence.

4,049,014

POWER TRANSMISSION

Gary L. Johnson, Pontiac, Mich., and Walter J. Zoya, Rolling Hills Estates, Calif., assignors to Sperry Rand Corporation, Troy, Mich.

Filed Oct. 3, 1975, Ser. No. 619,532
Int. Cl.[2] F16K *43/00*
U.S. Cl. 137—315 **3 Claims**



1. A cartridge type sleeve valve comprising a body having at least two spaced passages, a stepped bore in the body connecting the passages, a replacable cartridge mounted in the bore, a closure plug retaining the cartridge in the bore and a spring in the opposite end of the bore, the cartridge comprising a stationary outer sleeve having a lateral opening to one passage and an axial opening to the other passage, an elastomeric seal in the sleeve between the passages, a plunger slidable in the sleeve and having a first section positionable within the seal to block flow between the passages and a second section positionable within the seal to connect the passages, and a spring in the bore at the end opposite the closure plug biasing the plunger to closed position, the plunger being shiftable by pressure in the one passage from closed to open position against the spring bias.

4,049,015

CHECK VALVE ASSEMBLY

Cicero C. Brown, deceased, late of Houston, Tex., by Joe R. Brown, executor, assignor to Brown Oil Tools, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 495,901, Aug. 8, 1974, which is a division of Ser. No. 322,226, Jan. 9, 1973, Pat. No. 3,850,191.
This application Feb. 2, 1976, Ser. No. 654,522
Int. Cl.[2] F16K *15/04*
U.S. Cl. 137—496 **6 Claims**

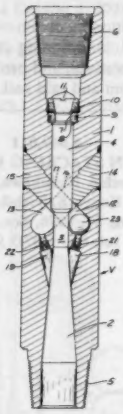
1. A check valve assembly for permitting unrestricted flow in one direction and limited flow in the reverse direction comprising:

a. a valve body having a longitudinal flowbore therethrough comprising first and third concentric sections connected by a second concentric section of restricted diameter;

b. seat means carried by said valve body at one end of said third flowbore section;

c. a pair of discreet recesses in said valve body communicating with said flowbore near the junction of said second and third flowbore sections and inclined from said flowbore radially and longitudinally away from said third section;

d. ball closure means for disposal in either one of said recesses and movable into said flowbore for sealing engagement with said seat means, in response to a predetermined rate of reverse flow through said check valve assembly, to block reverse flow of fluid through said check valve assembly;



e. a pair of elongate equalizing passages each having one end communicating with said first flowbore section and another end communicating with a respective one of said recesses, each of said equalizing passages having at least a part thereof adjacent said one end which is radially and longitudinally inclined with respect to said first flowbore section and adapted to receive replaceable orifice means, and

f. means preventing direct communication between said flowbore and a portion of each of said equalizing passages intermediate the ends of said equalizing passage.

4,049,016

COMBINATION EXCESS FLOW AND DISCONNECT SHUTOFF VALVE FITTING

Ralph Eugene Henry, Rixford, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 13, 1976, Ser. No. 686,205
Int. Cl.[2] F16K *15/06*
U.S. Cl. 137—498 **7 Claims**

1. An excess flow pipe fitting for gas service piping comprising in combination:

a. a tubular body defining an at least partially annular flow passage between an inlet and an outlet and sized for insertion within gas service piping for effecting a seal tight mounting therein;

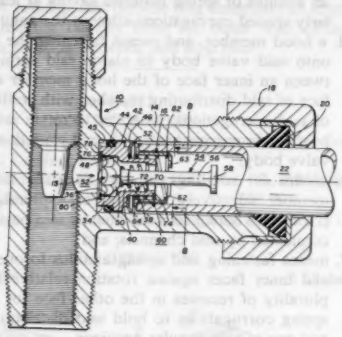
b. an annular seat defined in said passage at an intermediate location thereof;

c. a poppet in said passage for cooperating with said seat to open and close said passage to gas flow of the piping with which it is to be utilized; and

d. poppet biasing means urging said poppet away from said

seat toward the open position of said passage in opposition to gas flow received through said inlet;

e. said poppet having a head of polygonal periphery positioned in the annular portion of said flow passage and facing the inlet of said body to define a flow control orifice of varying dimension with respect to the passage wall



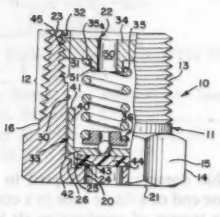
thereat; said head having a front face confronting the inlet gas flow that is formed multiply dished sloping inwardly away from a central portion thereof toward the flats of said polygonal periphery and being responsive to excess flow pressure encountered at said inlet for moving said poppet in opposition to said poppet biasing means toward the closed position of said passage.

4,049,017

ADJUSTABLE RELIEF VALVE

Evan Jones, Evanston, Ill., assignor to Henry Valve Company, Melrose Park, Ill.

Filed Apr. 12, 1976, Ser. No. 675,975
Int. Cl.² F16K *15/02*
U.S. Cl. 137—540 **2 Claims**



1. In a relief valve for a refrigeration system including

a valve body having an inlet, an outlet, and a passageway extending therebetween;

a stationary annular valve seat forming a portion of said passageway;

a valve member slidably retained in said passageway including a surface thereon which is adapted for moving into and out of sealing engagement with said valve seat as said valve member slides in said passageway;

adjustable retaining means which threadedly engage a portion of said passageway, and

spring biasing means including a coil spring and a disc-shape spring guide mounted on one end of said spring positioned in said passageway between said adjustable retaining means and said slidable valve member for biasing said sealing surface against said valve seat, the improvement comprising:

bearing means including a ball bearing, substantially concave bearing surfaces axially aligned on said retaining means and said spring guide into which said ball bearing is positioned, and holes through said retaining means and said spring guide in communication with said concave bearing surfaces thereon for providing a means of escape for particulate matter finding its way between said bearing surfaces and said ball bearing; and

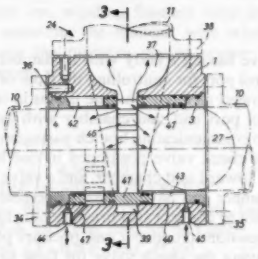
said bearing means having a lower coefficient of friction than that between said sealing surface and said valve seat when engaged for preventing the rotational force necessary to adjust said retaining means from extending to said sealing engagement between said valve seat and said sealing surface.

4,049,018

SHUT-OFF AND REGULATOR DEVICE FOR CONTROLLABLE MECHANISMS INTENDED FOR INSTALLATION IN PIPELINES

Hubert Skibowski, Schimmelmannstieg 3, 2 Hamburg 70, Germany

Continuation of Ser. No. 451,746, March 18, 1974, abandoned. This application July 18, 1975, Ser. No. 597,200
Claims priority, application Germany, Mar. 24, 1973, 2314702; Apr. 11, 1973, 2318165; Apr. 4, 1973, 2316681
Int. Cl.² F16K *3/26*
U.S. Cl. 137—561 R **4 Claims**



1. A valved tee fitting to be mounted in a fluid line comprising, in combination, a housing having an open unobstructed primary cylindrical flow passage defined therein, means defined on said housing for attaching said housing in a fluid line wherein said flow passage is coaxial with the fluid line, said passage being defined by an annular guiding bushing axially fixed within said housing having a central region, end regions, an inner cylindrical surface and an outer cylindrical surface, said inner cylindrical surface defining the minimum diameter of said flow passage, a lateral flow passage defined in said housing transversely disposed to said primary flow passage, means defined on said housing for attaching a lateral fluid line to said housing in communication with said lateral flow passage, at least one first port defined in said bushing central region selectively communicating with and in radial alignment with said lateral flow passsage, an annular chamber defined in said housing in radial alignment with said bushing having an inner cylindrical surface defined by said bushing outer surface, an annular spool sleeve axially defined by ends and defining a shut-off element axially slidably received within said chamber for movement between first and second axial positions and sealed with respect to said bushing outer surface, at least one second radial port defined in said spool radially aligning with said first port at said sleeve first position, said sleeve sealing said first port at said sleeve second position, control pressure medium ports defined on the exterior of said housing communicating with said chamber at each end of said sleeve and selectively communicating with a controlled source of fluid pressure whereby said sleeve comprises a piston selectively movable between said first and second positions by a controlled pressurized medium, sealing means on said sleeve sealing said chamber and said control pressure ports from communication with said housing flow passage, said lateral flow passage defined in said housing communicating with said second port upon alignment of said first and second ports permitting

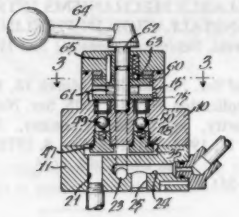
fluid flow through said housing from said primary flow pas sage through said lateral flow passage.

4,049,019

ROTARY VALVE

Samuel B. McClocklin, Owatonna, Minn., assignor to Owatonna Tool Company, Owatonna, Minn.

Filed Sept. 13, 1976, Ser. No. 723,025
Int. Cl.[2] F15B *13/04*
U.S. Cl. 137—625.21 **9 Claims**



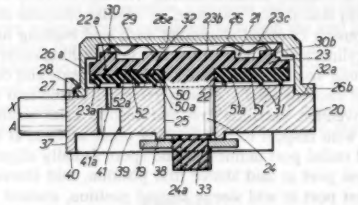
1. A valve having a body with a chamber, a pressure port, and a control port for controlling the flow of fluid to and from a fluid-operated member, passage means in said body between said control port and said chamber with said passage means having two communicating branch passages connecting to said chamber, a check valve positioned in one branch passage to block flow toward said chamber, and a valve member movable in said chamber and having means operable in a first neutral hold position to connect said pressure port to tank, operable in a second position to connect said pressure port to said branch passage having the check valve for flow to the control port, and operable in a third position to connect the other of said branch passages to tank with movement of the valve member from the second position back to the first position not permitting flow from said control port to said chamber because of said check valve.

4,049,020

VACUUM CONTROL VALVE

Rene Elie Neveux, Les Clayes-sous-Bois, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed May 4, 1976, Ser. No. 683,223
Claims priority, application France, May 5, 1975, 75.13994
Int. Cl.[2] F16K *11/02*
U.S. Cl. 137—625.11 **7 Claims**



1. A control valve comprising:

a. a valve body having a smooth surface, a plurality of ports, a plurality of passages bored through the valve body and opening in the smooth surface, each said passage leading to a respective one of said ports, and a bore formed centrally though the body;

b. a distributing member having a hub portion engageable though said bore for mounting the distributing member for rotation, a distributing surface with a plurality of ribs extending along coaxial part-circular respective lines and a plurality of radially extending rib portions intersecting the same, said ribs and rib portions projecting on said distributing surface to define therewith and with said smooth surface a plurality of coaxial channels of part-annular shapes and an outer face;

c. an annulus of spring material having at least three angularly spaced currugations athwart the annulus;

d. a hood member, and means fastening the hood member onto said valve body to clamp said spring annulus between an inner face of the hood member and said outer face of said distributing member with resilient deflection of said corrugations, whereby to retain said ribs and rib portions in engagement with said smooth surface of said valve body;

e. means for rotating said hub to place said distributing member selectively into any of a plurality of angular positions wherein selected ones of said passages are interconnected by said channels; and

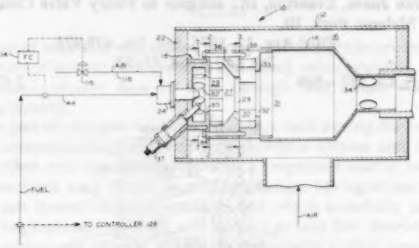
f. means fastening said spring annulus to one of said outer and inner faces against rotation relative thereto, and a plurality of recesses in the other face for receiving said spring corrugations to hold said distributing member in any one of said angular positions.

4,049,021

VARIABLE DOME VALVES AND COMBUSTORS PROVIDED WITH SAID VALVES

Ellsworth H. Fromm, and Norman R. Murray, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 14, 1975, Ser. No. 567,954
Int. Cl.[2] F16K *5/10*
U.S. Cl. 137—625.31 **10 Claims**



1. A variable dome valve, adapted to be mounted on the upstream dome end of a flame tube in a combustor for controlling flow of a stream of combustion air into said flame tube, said valve comprising:

a fixed generally cylindrical inner member, closed at one end to the flow of said combustion air and open to the flow of said combustion air at the other end;

a plurality of openings provided at spaced apart locations around and extending through the cylindrical wall of said inner member adjacent said closed end thereof;

a mounting flange secured to and around said inner member adjacent said open end thereof for mounting said valve on a said flame tube;

an adjustable throttle ring rotatably mounted on and around said cylindrical inner member;

a plurality of openings provided around and extending through said throttle ring, said openings being of a size, a shape, a number, and located at spaced apart locations, corresponding to said openings in said inner member, and

means for rotating said throttle ring around said inner cylindrical member so as to bring said openings in said throttle ring into and out of register with said openings in said inner member and vary the effective combined open area of said openings and thereby control the flow of said stream of combustion air into said flame tube, wherein:

a groove is provided in said mounting flange adjacent and around the base of said cylindrical inner member;

said throttle ring seats in and rotates in said groove;

a pair of spaced apart stop pins extend perpendicularly from said flange and adjacent the outer wall surface of said cylindrical inner member; and

said means for rotating said throttle ring comprises an actuator pin extending radially from the outer wall surface thereof at a location between said stop pins.

4,049,022

CONCRETE PIPES

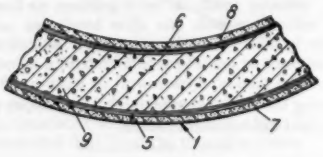
Robert M. Farahar, Sevenoaks, England, assignor to ARC Concrete Limited, London, England

Division of Ser. No. 370,145, June 14, 1973, Pat. No. 3,950,465. This application July 7, 1975, Ser. No. 593,791

Claims priority, application United Kingdom, July 27, 1972, 35184/72

Int. Cl.² B28B *21/48*

U.S. Cl. 138—176 **6 Claims**



1. A tubular body comprising an integrally and centrifugally cast mass of cementitious material including a matrix of inorganic cement which hardens by hydration, and a glass fibre strand or roving reinforcing said mass, said strand or roving being resistant to deterioration by said cementitious material and constituting a winding which extends around said body and is intimately incorporated in and bonded directly to said matrix.

4,049,023

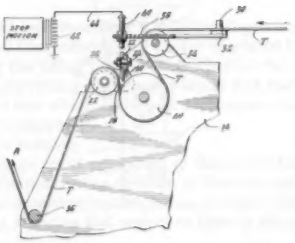
STOP MOTION FOR NARROW WIDTH NEEDLE LOOMS

Robert Doyal Frazier, Rome, Ga., assignor to Champion International Corporation, Stamford, Conn.

Filed May 25, 1976, Ser. No. 689,870

Int. Cl.² D03D *51/18*

U.S. Cl. 139—339 **4 Claims**



1. In a loom for forming a woven tape from yarn material and including a pair of woven tape pull rollers spaced to form a nip therebetween with the woven tape passed through the nip under tension and a stop motion device for stopping the loom when an excess of woven tape occurs in the nip such as with the commencement of a full wrap of woven tape around a tape pull roller the improvement including

conductive electrode means reciprocally mounted on said loom in the nip between said tape pull rollers for sensing the presence of excess yarn in said nip through physical displacement thereby; and

conductive stop means adjustably mounted on said loom in the path of the reciprocal motion of said electrode means for establishing an electric circuit to actuate said stop motion device and stop operation of said loom in response to contact by said electrode means .

4,049,024

MANDREL AND METHOD OF MANUFACTURING SAME

James J. Auborn, Groton, and Elizabeth Ann Trickett, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed June 4, 1976, Ser. No. 693,022

Int. Cl.² B21F *3/04*

U.S. Cl. 140—71.5 **15 Claims**

14. A process of making incandescent lamp filaments comprising the steps of directly electroplating a tungsten electrodeposition solution contaminated with from about 0.1 to about 0.3 gms/l of copper ion, winding filament wire around the tungsten coating, annealing the filament wire winding, and selectively dissolving the tungsten coated copper substrate metal from the filament wire.

4,049,025

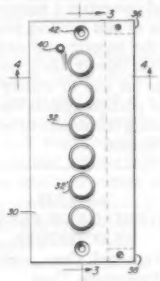
WIRE BENDING FIXTURE

Abel R. Gillingwater, 947 Wall St., Jeffersonville, Ind. 47130

Filed Feb. 24, 1976, Ser. No. 661,007

Int. Cl.² B21F *1/04, 45/00*

U.S. Cl. 140—102.5 **4 Claims**



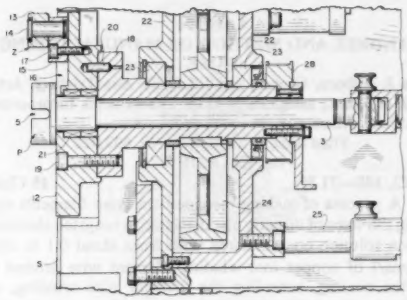
1. A wire bending fixture for shaping a length of wire comprising, means for forming the wire into a picture frame easel back including, a planar base plate having a top and bottom surface, a series of more than three spaced wire shaping knobs permanently arranged in a straight row on said top surface, a stop pin on said top surface laterally spaced from the first knob of said series, and a wire bending bar opposite to and spaced from said bottom surface of the plate and co-extensive with an edge thereof, the base plate being rectangular and the knobs mounted in a row parallel to and midway the longitudinal edges of the plate, said stop pin being positioned laterally of and above the first knob of the series so that a tangent line drawn between the wire engaging surfaces of the stop pin and knob defines an angle less than 90° with the center line of the series of knobs, the bar being aligned with the longitudinal edge of the plate farthest from the stop pin, and secured to the plate by spacer elements affixed to the upper and lower corners of the plate.

4,049,026

BENDING APPARATUS HAVING A SHAPED MANDREL USED IN AUTOMATIC BENDING MACHINES FOR METAL WIRE AND BAR STOCK

Remigio Del Fabro, 62-33010 Reana Del Rojale, Villaggio Morena (Udine), Italy

Filed Apr. 15, 1976, Ser. No. 677,171
Claims priority, application Italy, Apr. 18, 1975, 83354/75
Int. Cl.[2] B21D *7/024*
U.S. Cl. 140—105 **7 Claims**



1. Bending apparatus for use in automatic bending machines for metal wire, strip or bar stock and in particular for automatic bending machines for forming fasteners with continuous feeding comprising an axially movable, removably mounted, non-rotatable shaped central mandrel and a relatively rotatable and axially movable faceplate mounting a peripheral bending pin disposed coaxially therewith, a pair of shears disposed adjacent the mandrel in advance of the mandrel along the path of the movement of the stock past the mandrel, and means to automatically feed the stock through the mandrel, characterized in that the said central non-rotatable mandrel has substantially an L-shape and comprises a support rod lying axially at the center of rotation of said bending pin and an arm disposed perpendicularly to the support rod and having a U-shaped groove in the front face thereof, the groove being dimensioned to provide a passage for and to closely receive the stock to support the received portion against bending during bending and means for actuating the shears to sever the fastener from the stock after it is formed.

4,049,027

ACTIVE MATERIAL FOR PRESSED NICKEL ELECTRODES

Harvey N. Seiger, Waterford, Conn., assignor to Yardney Electric Corporation, Pawcatuck, Conn.

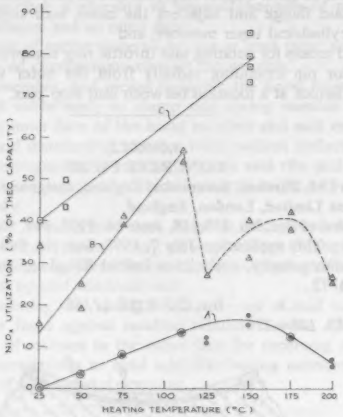
Filed Aug. 26, 1976, Ser. No. 717,860
Int. Cl.[2] H01M *4/88*
U.S. Cl. 141—1.1 **15 Claims**

1. A method of making an active electrode material admixture comprising the berthollides NiO_x and CoO_x where x is not an integer, said method comprising the steps of:

preparing a nickelous/cobaltous salt solution for addition to an oxidant/base solution to produce a salt/oxidant solution, by dissolving at least one nickelous salt and at least one cobaltous salt in water to provide a nickelous salt concentration in said salt/oxidant solution between about 0.17 molar and about 2 molar and a ratio of nickel to cobalt between about 9:1 and about 9.8:0.2;

preparing said oxidant/base solution by dissolving lithium hydroxide and an oxidizing agent in water to provide concentrations of said lithium hydroxide and oxidizing agent in said salt/oxidant solution between about 2 molar and about 6.5 molar and between about 0.34 molar and about 1 molar, respectively;

slowly adding said nickelous/cobaltous salt solution with stirring to said oxidant/base solution to produce said salt/oxidant solution, whereby said NiO_x and CoO_x are formed in said salt/oxidant solution and co-precipitated therefrom as a lithium-containing black precipitate; and



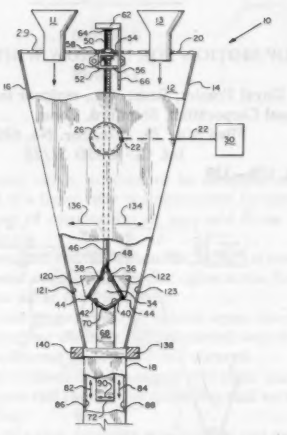
recovering the lithium-containing NiO_x/CoO_x co-precipitate from said salt/oxidant solution.

4,049,028

TRANSITION SECTION FOR A BAG FILLING DEVICE AND METHOD

Thomas C. Harris, Monroe, and Charles E. DeCrane, West Monroe, both of La., assignors to Olinkraft, Inc., West Monroe, La.

Filed Mar. 25, 1976, Ser. No. 670,284
Int. Cl.[2] B65B *1/06*; B67D *5/06*
U.S. Cl. 141—10 **15 Claims**



1. In a bag filling machine having a weighing section with alternately discharging weighing hoppers disposed in communication with respective opposite sides of a bag filling section by means of an intermediate transition section, the improvement which comprises in combination:

a. said transition section having a chute projecting downwardly with a portion thereof inclined inwardly, and terminating in a substantially vertical elongated throat section defining the bag filling section;

b. a control device, means for suspending the control device

in said inwardly inclined portion of the chute, said control device having means permitting movement thereof in a generally horizontal direction within said inwardly inclined portion of the chute in response to alternate discharge of the weighing hoppers, said control device serving to absorb energy of the material flowing in the filling machine as it falls in the transition section and also serving to control flow of the material in the transition section, said control device serving also to allow dust to be generated in the upper portion of the transition section where it can be readily removed;

c. an elongated divider member rigidly attached to said control device at one end thereof and extending into said vertical elongated throat section a predetermined distance, said divider member being also movable in a generally horizontal direction as said control device moves, said divider member defining in cooperation with inner surfaces of said vertical elongated throat section at least two flow paths within said vertical elongated throat section, one flow path being utilized for downwardly flow of the material being filled in the bag filling machine and another flow path being utilized for upwardly flow of suspended dust and air resulting from the filling process;

d. means, associated with said divider member and said throat section, for stopping the movement of said divider member at a predetermined position so that the path utilized for upward air flow always remains open regardless of the position of said divider member; and

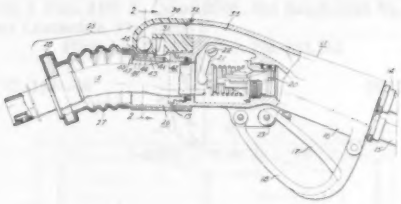
e. means, associated with said transition chute, for removing the suspended dust from the transition chute.

4,049,029

VALVE SYSTEM FOR A VAPOR RECEIVING SYSTEM ON A DISPENSING NOZZLE

William B. Hansel, Media, Pa., assignor to Suntech, Inc., St. Davids, Pa.

Filed Mar. 8, 1976, Ser. No. 665,147
Int. Cl.[2] B65C 3/02
U.S. Cl. 141—206 **6 Claims**



1. A liquid fuel dispensing nozzle for dispensing fuel into a fuel tank and for receiving fuel vapors displaced from the fuel tank during the filling process, and wherein the nozzle has a system for preventing the flow of liquid fuel back through a vapor return line which carries the fuel vapors away from the nozzle, and comprising:

a. a nozzle housing;

b. a discharge spout connected to the nozzle housing;

c. means for controlling the flow of fuel through the nozzle;

d. a vapor receiving system having a vapor return passageway for allowing fuel vapors to flow to the vapor return line;

e. means, responsive to the liquid fuel backing up to the discharge spout, for automatically disabling the controlling means so that dispensing is terminated; and

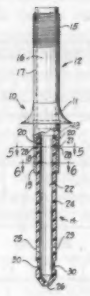
f. means for preventing the flow of liquid fuel through the vapor receiving system and including a valve seat through which fuel vapors flow when they flow through the vapor receiving system, and means responsive to the level of liquid fuel in the vapor receiving system, for covering the valve seat, whereby when the liquid fuel level in the vapor receiving system reaches a predetermined level, the valve seat will be covered and liquid fuel will be prevented from flowing into the vapor return line.

4,049,030

VENT TUBE WITH REMOVABLE TIP FOR FILLING CONTAINERS

Alfred A. Abramoska, Jr., Medina, Ohio, assignor to Arthur Products Co., Medina, Ohio

Filed Apr. 2, 1976, Ser. No. 673,295
Int. Cl.[2] B65B 3/04
U.S. Cl. 141—286 **8 Claims**



1. A vent tube for a container filling machine to be disposed within a container as it is being filled with liquid, which comprises:

a tubular body having a wall with an interior axially extending first passage through which gas may be vented as the container is being filled and having means for attachment to the filling machine at its upper end, said tubular body having a socket comprising a wall at its lower end for receiving a tip and said tubular body being provided with locking means for removably holding the tip in said socket; and

a tubular tip comprising a wall surrounding an interior axially extending second passage for venting gas and having at least one opening in said wall at a predetermined level by which the gas being vented enters said second passage, said tip having lock engagement means for removably attaching said tip to said tubular body at a predetermined level by insertion into said socket and into engagement with said locking means, and said tip being adapted to be removably held at said predetermined level in said socket by said locking means.

4,049,031

AUTOMATIC FRACTION COLLECTOR

David J. Cooper, Downingtown; George W. Gebhardt, Philadelphia; Joseph R. Valenta, Wayne, all of Pa., and Francis E. Wdzieczkowski, Barrington, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Dec. 22, 1975, Ser. No. 642,704
Int. Cl.[2] B67C 3/26, 3/34
U.S. Cl. 141—284 **5 Claims**

1. A liquid fraction collector comprising:

a first series of containers,

a second series of containers,

a conduit leading upwardly from each container in said first series with the upper ends of the conduits lying in a first row,

a conduit leading upwardly from each container in said second series with the upper ends of the conduits lying in a second row parallel to the first row,

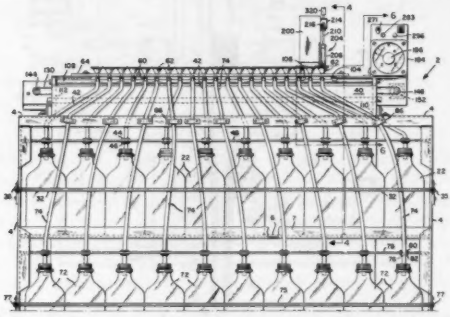
a carriage,

a stationary carriage support parallel to said rows and sup-

porting the carriage above said rows for movement along a straight line at a fixed distance from each row,

means mounted on the carriage to discharge a liquid comprising an inverted V guide member having one trough over one row and another trough over the other row and a discharge tube having a discharge end,

means to advance the carriage along a straight line on the stationary support stepwise from one conduit to the next and return it stepwise along said straight line on the stationary support to said one end, and



means mounted on the carriage to adjust the discharge means to discharge into the conduits of one row as the carriage advances and to change the adjustment to cause discharge into the conduits of the other row when the carriage returns,

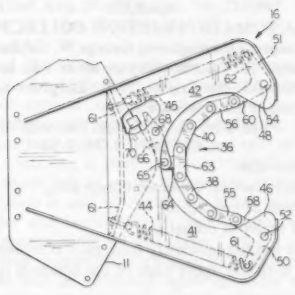
said last mentioned means comprising means to move the discharge end of the discharge tube relative to the carriage from a position over one trough of the guide member to a position over the other trough of the guide member when the direction of movement of the carriage is reversed.

4,049,032

CHAIN DELIMBER ASSEMBLY FOR TREE HARVESTER

Dorrance Oldenburg, Yorkville, and Robert L. Fischer, New Lenox, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 24, 1975, Ser. No. 644,234
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—2 Z **6 Claims**



2. In a delimber assembly suitable for use with a tree harvesting machine including elongate, flexible blade means for cutting limbs from a tree, means connected between the machine and the oppositely disposed end portions of the blade means for urging the end portions outwardly from the machine, means on the machine for urging the tree against the blade means, and means on the machine for moving a tree through the delimber assembly, the improvement comprising:

a lever pivotally mounted on the assembly, said lever being operatively connected to a portion of the blade means intermediate the oppositely disposed end portions for movably supporting said intermediate portion, said lever permitting relative motion between the machine and said intermediate portion whereby said intermediate portion of the blade means is permitted to float along the tree surface, and the blade means at least partially encircles and engages the tree so that the limbs of the tree are cut off near the surface of the tree by the blade means as the tree moves through the delimber assembly; and

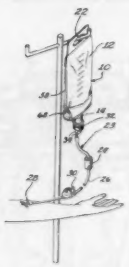
stop means carried by said assembly adjacent said lever to provide an abutment for said lever whereby said lever pivots only a predetermined amount so that said intermediate portion is movable outwardly until said lever abuts said stop means.

4,049,033

MOLDED COLLAPSIBLE SOLUTION CONTAINER

Philip G. Ralston, Jr., Buffalo Grove, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 526,092, Nov. 21, 1974. This application Oct. 9, 1975, Ser. No. 621,095
Int. Cl.[2] B65D *1/02*
U.S. Cl. 105—.5 **6 Claims**



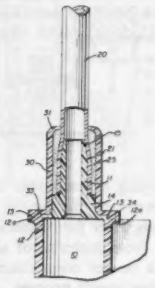
1. A molded, collapsible solution container, which container defines a chamber-defining body portion wall having an integral neck portion and shoulder portion at one end thereof, and is sealed at its end opposite said one end, the improvement comprising: in combination, said shoulder portion being generally oval, said body portion defining, in its normal, unstressed state, a generally oval, transverse cross-section adjacent said neck and shoulder portion, said cross-section tapering progressively along a major portion of its length to a flat, sealed end portion at said end of the container opposite to said one end and extending in the direction of the longitudinal axis of the container, to facilitate a uniform manner of flat collapse of said container progressively from said opposite end towards said one end as the contents thereof are withdrawn through said neck portion, when said container is disposed in neck-downward position, the chamber end opposite to said one end being tapered sufficiently narrowly to permit essentially all of the chamber-defining wall of the body portion adjacent said chamber end to collapse flat together upon said withdrawal of the contents.

4,049,034

ATTACHING MEANS AND METHOD FOR ATTACHING FLEXIBLE TUBING TO A PLASTIC CONTAINER

John Leonard Vcelka, Zion, and David A. Winchell, Twin Lakes, both of Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed July 14, 1976, Ser. No. 705,319
Int. Cl.[2] B32B 5/22
U.S. Cl. 150—8 11 Claims



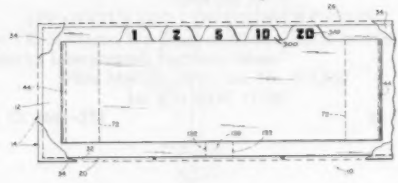
1. An improved attaching means for permanently attaching a flexible tube to a stub port of a container of the type wherein an end of the tube is fitted over the stub port, said attaching means comprising a tight-fitting resilient ring fitted over the tube end and over the stub port sealing the tube end against the stub port, and a retainer cap fitted over the ring, said retainer cap being rigidly connected to said container, said retaining cap and ring resiliently squeezing the tube around the stub port, said retainer cap including an inwardly turned lip for preventing axial movement of said resilient ring.

4,049,035

CURRENCY BILL BILLFOLD FILE

Donald J. Finn, 5100 N. Ocean Blvd., Sea Ranch Club No. 712, Fort Lauderdale, Fla. 33308

Filed Jan. 25, 1977, Ser. No. 762,262
Int. Cl.[2] A45C 1/06
U.S. Cl. 150—38 15 Claims



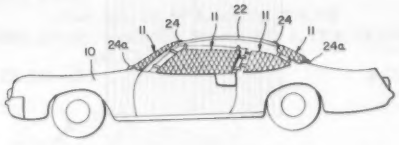
1. A billfold file for receiving currency bills, said file being for carrying inside a billfold for quick, easy and accurate storage and removal of bills, said file comprising: a master plate, said master plate being formed of semi-rigid bendable material of sufficient rigidity as to maintain itself upright when in a billfold during times when said billfold is held with its open side upward containing said master plate, said master plate being a thin sheet of material, left and right retainers attached to said master plate and protruding from said master plate and each disposed offset from said master plate, said left and right retainers respectively having left and right retainer edges extending transversely to said elongation of said master plate, and a plurality of substantially parallel panels of flexible material, said panels having a central bill-engaging portion for engaging currency bills disposed between adjacent panels, said panels being sufficiently rigid as to tend to remain with their central bill-engaging portions disposed substantially in vertical planes respectively during times when a billfold containing said file is held unfolded with its open end upward, said bill-engaging portions of said panels each being of a size for totally receiving there against a conventional currency bill disposed in parallelism therewith, each of said panels having left and right positioning end portions disposed in parallelism with respective left and right end portions of said bill engaging portions thereof, each of said panels having a left end and a right end inter-connection portion respectively interconnecting the said bill engaging portion with the left and right positioning end portion thereof, said positioning end portions being disposed on the master plate side of said off-set retainers respectively, said inter-connecting portions extending around said retainer edges respectively, said panels each being sufficiently taut between its two inter-connecting portions and said panels each being formed of sufficiently rigid material that the inter-connecting portions of each panel in normal use each hold a position extending around the respective retainer edges thereof, the left and right interconnection portions of said panels being disposed at progressively greater distances from respective retainer edges, said panels being disposed one inside another with the space between the positioning end portion and the bill-engaging portion of each respective panel being greater than the equivalent spacing for any of the panels disposed inwardly thereof.

4,049,036

WINDSHIELD COVERS

Paul A. Gebhardt, 917 N. 11th St., Springfield, Ill. 62702

Filed Aug. 3, 1976, Ser. No. 711,415
Int. Cl.[2] B60J 11/00
U.S. Cl. 150—52 K 6 Claims



1. A vehicle window cover, comprising a pair of sheets in opposing relation, said sheets joined about their ends forming a pocket, resilient means disposed in said pocket in spaced apart relation, said means being a plurality of springs defining a plurality of interstices, and a plurality of clip means engaging said pocket and adapted to affix said cover to a window of a vehicle.

4,049,037

INFLATION VALVE FOR TUBELESS TIRE

Ronald J. Gale, Hornchurch, and Edwin M. Rowbotham, Colchester, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed June 7, 1976, Ser. No. 693,575
Claims priority, application United Kingdom, June 10, 1975, 24738/75
Int. Cl.[2] B60C 29/00
U.S. Cl. 152—427 5 Claims

1. An inflation valve assembly for a wheel and tubeless tire combination comprising a valve housing having an interior wall defining an air passage;

said interior wall having a screw-threaded portion constructed to threadedly receive a valve core;

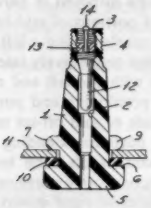
said housing having a shoulder and a flange means spaced apart from said shoulder;

said flange means comprising a plurality of circumferentially spaced apart flange portions;

said shoulder and said flange means defining a groove therebetween constructed to receive the periphery of a valve hole in a wheel rim;

an elastomeric annular seal disposed in said groove sealingly engaging said shoulder and constructed to engage said wheel rim;

said screw-threaded portion, said shoulder and said flange means being integral portions of said housing;



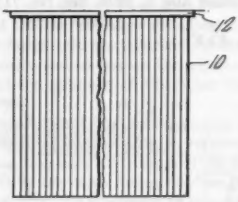
said seal being a separate element from said shoulder and said shoulder having substantially greater rigidity than said seal.

4,049,038

LOUVERED COVERING SYSTEM

David L. Hyman; Robert J. Cayton, and Kurt E. Rosenquist, all of Pacific Palisades, Calif., assignors to Louverdrape, Inc., Santa Monica, Calif.

Filed Apr. 23, 1976, Ser. No. 679,764
Int. Cl.[2] E06B 9/26
U.S. Cl. 160—166 A **5 Claims**



1. A louvered covering system comprising

a vertical louver support system;

elongate louvers, each said elongate louver including means adjacent one end thereof for attachment to said vertical louver support system such that said elongate louver depends vertically therefrom, an elongate panel forming the body of said elongate louver, a flange along each elongate edge of said panel, said flanges extending inwardly toward one another on a first side of said panel, an elongate sheet slidably arranged on said elongate panel between said flanges, and mounting means for fixing said sheet at one spot only to said panel near said attachment means.

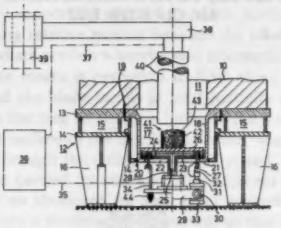
4,049,039

METHOD AND APPARATUS FOR THE PRODUCTION OF SOLID FORGING BLOCKS WITH MANIPULATOR PINS

Helmut Theodor Gröf, Brouchkobel; Jochen Schumann, Maintal; Anton Wamser; Rainer Schumann, both of Hanau am Main, and Werner Friedrich Thomas, Hasselroth, all of Germany, assignors to Leybold-Heraeus GmbH & Co. Kg, Cologne, Germany

Filed Oct. 15, 1976, Ser. No. 732,962
Claims priority, application Germany, Dec. 6, 1975, 2554959
Int. Cl.[2] B22D 19/00, 27/02
U.S. Cl. 164—52 **10 Claims**

1. In a method for the manufacture of solid forging blocks with manipulator pins wherein an ingot having a vertical borehole is filled by an electro-slag remelt process with at least one consumable electrode, the improvement comprising placing the ingot with the vertical borehole on a block table with at least one power connection in the region of said block table and with the vertical borehole of the ingot aligned with a depression in the block table for slag start material, the depth of the depression being at least 25% of the diameter of the



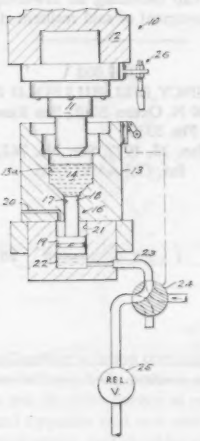
ingot borehole, applying a a movable starting disk as lower boundary of the depression; placing the slag start material on top of said disk; filling after formation of liquid slag said depression exclusively from material of said consumable electrode; and feeding a power connection to the starting disk along during the entire remelt process.

4,049,040

SQUEEZE CASTING APPARATUS AND METHOD

Richard F. Lynch, Toledo, Ohio, assignor to N L Industries, Inc., New York, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,687
Int. Cl.[2] B22D 27/12
U.S. Cl. 164—120 **12 Claims**



1. A method of casting a metal article, comprising:

placing a quantity of molten metal into an open-topped female die, such quantity being in excess of the quantity required for the article;

lowering a sealingly fitted punch die into the female die until the molten material fills the resulting closed die cavity;

continuing to lower the punch die until a predetermined punch position is reached, while forming a die extension and displacing excess metal into the die extension from the closed die cavity;

terminating die extension formation and the displacement of metal from the die cavity when the predetermined punch position is reached;

applying a continuous high pressing force on the punch die until the metal has solidified; and

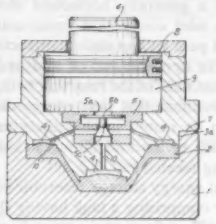
retracting the punch die.

4,049,041

METHOD OF AND APPARATUS FOR FLUID DIE STAMPING

Ivan Dimov Nikolov; Hristo Georgiev Kortenski; Dimiter Tanev Dimitrov, and Asparuh Mihaylov Antonov, all of Sofia, Bulgaria, assignors to Institute po Metalosnanie i Technologia na Metalite pri Ban, Sofia, Bulgaria

Filed Aug. 20, 1975, Ser. No. 606,208
Claims priority, application Bulgaria, Aug. 30, 1974, 27602
Int. Cl.[2] B22D *27/12, 27/14*
U.S. Cl. 164—120 **3 Claims**



1. A method of fluid die stamping which comprises:

pouring a fluid material between members of a stamping die having a stamping surface comprising a stationary member and a movable member provided with at least one cavity extending over a limited region of said stamping surface;

forcing the movable member into the stationary member to distribute and compress said fluid in said cavity; and

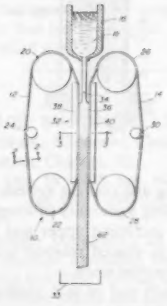
arresting the movable member and forcing a piston located within said movable member toward said cavity to compress a gas in said movable member and force said compressed gas through at least one channel leading to the cavity to exert additional pressure on the fluid material between the members and exposed to the cavity at said limited region.

4,049,042

APPARATUS FOR CONTINUOUS CASTING

Robert E. Maringer, Worthington, Ohio, assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 31, 1976, Ser. No. 672,569
Int. Cl.[2] B22C *11/06*
U.S. Cl. 164—278 **12 Claims**



1. A continuous casting assembly comprising:

a plurality of flexible belts;

means defining a continuous path for each belt including a common region of proximate travel wherein the paths are generally parallel and radially disposed about a central axis;

means conducting the belts along their respective paths and in a common direction through the proximately travelled region, the paths being spaced therethrough to define a travelling open-ended axially-extending mold channel between the opposing surfaces of the belts,

each of the belts including an inner face for defining a portion of the channel wall during the period of proximate travel, an outer face, and a pair of oblique edges therebetween,

the edges of each belt being contiguous with a complimentary edge of an adjacent belt during the period of proximate travel to supportably contact the adjacent edge through the proximately travelled region;

means for continuously injecting a quantity of molten material into one end of the channel;

means for cooling the molten material to a solid form while within the channel; and

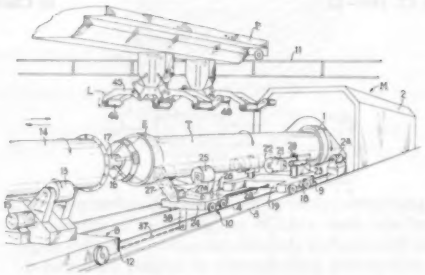
means for collecting the solidified material at the other end of the channel.

4,049,043

INSTALLATION FOR EXTRACTING PIPES FROM A CENTRIFUGAL CASTING MACHINE

Pierre Henri Marie Fort, Nancy, and Michel Pierrel, Pont-a-Mousson, both of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed June 26, 1975, Ser. No. 590,739
Claims priority, application France, July 8, 1974, 74.23701
Int. Cl.[2] B22D *13/02, 13/10*
U.S. Cl. 164—295 **8 Claims**

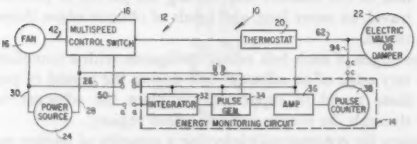


1. An installation comprising a rotary mould of a centrifugal casting machine, means for rotating said mould at a given speed and in a given direction about an axis, and means for extracting a cast pipe from the mould, said extracting means comprising an extracting carriage movable parallel to said axis, pipe extracting tongs coaxial with the mould and carried by the carriage, a tubular girder coaxial with the mould and having a diameter substantially equal to the diameter of the cast pipe, the extracting tongs being mounted inside and connected to rotate with the tubular girder and extending beyond an end of the girder adjacent the mould, rotatable rollers carried by the carriage and rollingly supporting the girder adjacent opposite ends of the girder, a motor drivingly connected to at least one of said rollers to drive the girder and tongs in rotation about said axis, and means for synchronizing the speed and direction of rotation of the tongs with the speed and direction of rotation of the mould during pipe extraction.

4,049,044
HEATING AND COOLING SYSTEM CONSUMPTION METER

David J. Cohen, 9614 N. Crawford Ave., Skokie, Ill. 60076

Filed Jan. 28, 1976, Ser. No. 653,224
Int. Cl.[2] F28F *0/00*
U.S. Cl. 165—11 15 Claims



1. A device for monitoring the heating and cooling energy consumed by a single unit of a multi-unit building, in proportion to the total energy consumed by said multi-unit building, said device comprising in combination:

a control circuit for controlling the speed of a blower fan, said blower fan being used to force heated and cooled air into the single unit;

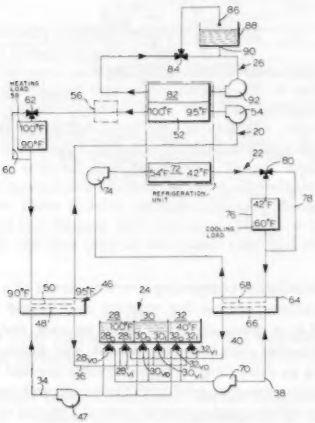
an energy monitoring circuit for monitoring the amount of heating and cooling energy used in a unit, said circuit being electrically coupled to said control circuit, said energy monitoring circuit having an integrating circuit, a pluse generator, and a pulse counter;

wherein said integrating circuit is electrically coupled to the pulse generator and the pulse generator is electrically coupled to the pulse counter.

4,049,045
HEATING AND COOLING SYSTEM FOR BUILDINGS

Gerhard W. Moog, Toronto, and Kenneth R. Cooper, Don Mills, both of Canada, assignors to Canada Square Management Limited, Toronto, Canada

Filed May 21, 1975, Ser. No. 579,341
Int. Cl.[2] F24D *11/00*; F25B *29/00*
U.S. Cl. 165—12 10 Claims



10. In a heating and cooling system for a building having a heating load and cooling load, the system including:

a cooling circuit for a cooling fluid; means in said circuit for cooling said fluid by removing heat energy therefrom; and means for circulating said fluid in said circuit; the building cooling load being connectible in said circuit so that said fluid can pass through the building load; and,

a heating circuit for a heating fluid; means in said heating circuit for retrieving heat energy removed from the cooling fluid by said cooling means and for transferring said heat energy to the heating fluid; and means for circulating said fluid in said circuit; the building heating load being connectible in said circuit so that said heating fluid can pass through the building load;

the improvement comprising:

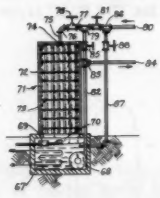
a. a first heat energy storage reservoir containing a fluid, the reservoir comprising a tank having therein a plurality of upright baffles disposed in spaced, generally parallel positions, each baffle extending from the bottom of the tank to a position above the level of the fluid, and from an upright wall of the tank to a position spaced from an opposite upright wall so that the baffles together define an elongate fluid flow path of serpentine form along which the fluid can blow in the form of a column in a generally horizontal direction, the tank having an inlet connection communicating with one end of said path and an outlet connection communicating with the opposite end of said path, said inlet and outlet connections of the reservoir being coupled to said cooling circuit so that heat energy derived from said circuit can be stored in the reservoir for subsequent transfer back to the said circuit to assist the action of said cooling means; and,

b. a second heat energy storage reservoir containing a fluid, the reservoir comprising a tank having therein a plurality of upright baffles disposed in spaced, generally parallel positions, each baffle extending from the bottom of the tank to a position above the level of the fluid, and from an upright wall of the tank to a position spaced from an opposite upright wall so that the baffles together define an elongate fluid flow path of serpentine form along which the fluid can flow in the form of a column in a generally horizontal direction, the tank having an inlet connection communicating with one end of said path and an outlet connection communicating with the opposite end of said path, said inlet and outlet connections of the reservoir being coupled to said heating circuit so that heat energy derived from said circuit can be stored in the reservoir for subsequent transfer back to the said circuit to assist the action of said heat energy varying means.

4,049,046
SOLAR HEATING/COOLING SYSTEM

Mark N. Worthington, 10227 White Mountain Road, Sun City, Ariz. 85351

Continuation-in-part of Ser. No. 519,521, Oct. 31, 1974, Pat. No. 3,957,109. This application Feb. 17, 1976, Ser. No. 658,476
Int. Cl.[2] F24D *11/00*
U.S. Cl. 165—18 10 Claims



1. In a solar heating and cooling system:

a. a tier unit providing a plurality of longitudinal channels in parallel relation including upper and lower flat metallic sheets arranged in spaced relation with a longitudinally grooved sheet therebetween,

b. a manifold at each end of said channels communicating with all of said channels,

c. a duct extending from and communicating with each of said manifolds, one of said ducts constituting an air inlet and the other duct an air outlet,

d. said tier unit being arranged in a position having a vertical

component and thereby presenting upper and lower ends, a perforated feed pipe extending across the upper end of said upper flat sheet,

e. a trough at the lower end of the said upper flat sheet with a drain pipe connected to said trough,

f. a vertical evaporator having its upper end below the level of said trough,

g. a pipe connecting said drain pipe to the upper end of said evaporator,

h. a storage tank below and communicating with said evaporator,

i. a pipe extending from said storage tank to said feed pipe; and,

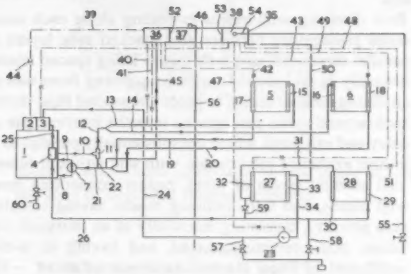
j. a pump for pumping water from said storage tank through one of said pipes to the circulated through said tier unit.

4,049,047

LIQUID HEAT EXCHANGE SYSTEM WITH SEPARATELY COMPARTMENTED MAKE-UP TANKS

John William Keen, Telford, England, assignor to Marston Excelsior Limited, England

Filed July 1, 1975, Ser. No. 592,269
Int. Cl.[2] F01P *3/12*
U.S. Cl. 165—107 **7 Claims**



1. A liquid filled heat exchanger system comprising a first circuit including at least one first heat generator and at least one first heat remover, a second circuit including at least one second heat generator and at least one second heat remover, the two circuits operating, in use at two different average temperatures, a liquid make-up tank for both circuits, the tank having three zones, a first zone, a second buffer zone and a third zone, the first zone being in direct communication with the second zone for the passage of liquid therebetween, the third zone being in direct communication with the second zone for the passage of liquid therebetween, there being no direct communication between the first and the third zones except through the second zone, a liquid supply line and at least one liquid bleed return line for the first circuit, the lines being connected to the first zone, a liquid supply line and at least one liquid bleed return line for the second circuit, the lines being connected to the third zone.

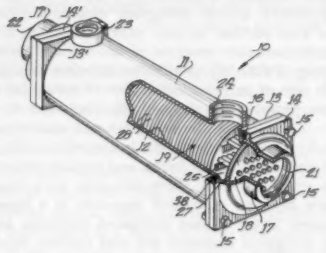
4,049,048

FINNED TUBE BUNDLE HEAT EXCHANGER

Harry W. T. Leedham, Kitchener, Canada, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 19, 1975, Ser. No. 642,506
Int. Cl.[2] F28F *9/22*
U.S. Cl. 165—159 **20 Claims**

1. A heat exchanger comprising an outer elongated shell having a central passage extending therethrough, a pair of header plates having first fluid conduit means associated therewith, a plurality of tubes within said shell and extending longitudinally thereof with their ends sealed within apertures in said header plates, said tubes being in communication with said first conduit means, a plurality of fins stacked on said tubes between the header plates and generally conformably received within said shell, each fin having a plurality of openings defined by annular flanges extending from one surface of each fin receiving the tubes therethrough and a plurality of slits therein providing for liquid flow therethrough and generally axially along the tubes, said fins being stacked with the flanges of one fin



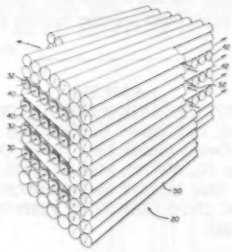
abutting the opposite surface of the next adjacent fin to provide for spacing between adjacent fins, and second fluid conduit means associated with said shell for communication thereinto for fluid contact with the fins and the outer surfaces of said tubes.

4,049,049

RECUPERATOR STRUCTURES

Donald F. Mold, and Ronald G. Rice, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 554,791, March 3, 1975. This application May 10, 1976, Ser. No. 684,698
Int. Cl.[2] C03C *23/20;* C03B *32/00;* F28D *7/00;* F28F *1/00*
U.S. Cl. 165—165 **4 Claims**



1. A recuperator heat exchanger assembly, comprising

a. a plurality of stacked layers of tubes, each tube having open ends and a portion intermediate the open ends which is essentially parallel to corresponding intermediate portions of the other tubes in the same layer and to corresponding intermediate tube portions in the other layers to form a first series of longitudinally extending parallel passageways for receiving a first fluid;

b. header connecting means for receiving the open tube ends of each layer and supporting the opening open ends in each layer to maintain the intermediate tube portions of each layer in a spaced relationship with respect to the intermediate tube portions of the tubes in at least one of the adjacent stacked layers in said assembly to define a second series of passageways between layers of intermediate tube portions for receiving a second fluid, said header connecting means closing the spaces between and around the open ends of said tube to prevent crossflow between the first and second fluid streams; and

c. wall means extending longitudinally along each of said second passageways for confining said second fluid in and directing the flow of the second fluid through said second series passageways in a direction parallel to and in heat

exchange relationship with the intermediate tube portions adjacent the second series passageways, said second fluid confining and directing means having entry and exit port means formed therein for receiving and discharging the second fluid, said second fluid confining and directing means including a plurality of layers of tightly packed individually axially elongated elements arranged with their axes parallel to each other and also parallel to the intermediate tube portions of said stacked layers of tubes, a group of such layers of elements being disposed adjacent each side of said stacked layers of tubes and the second series passageways formed therebetween to direct the flow of the second fluid through said second passageways in a direction parallel to the intermediate tube portions of said stacked layers of tubes, and sealant means comprised of a sintered frit of a crystallizable glass interposed between adjacent elongated elements in a layer, between adjacent layers of said elongated elements, and between said elongated elements and said stacked layers of tubes and said header connecting means, thereby joining said elongated elements as an integral part of said assembly and preventing crossflow between the first and second fluid streams; and

d. a further group of such layers of elements being disposed essentially parallel to the intermediate tube portions and between the first series layers and spaced inwardly in said second series passageways from said first-mentioned group of elements to guide the second fluid through each second series passageway in plural parallel paths,

e. said stacked layers of tubes, said header connecting means, and said second fluid confining and directing means being constructed of material having essentially zero porosity, consisting essentially of an inorganic crystalline oxide ceramic material, and having an average coefficient of lineal thermal expansion of about -18 to $+50 \times 10^{-7}$/° C over the range of 0°-300° C;

f. said stacked layers of tubes, said header connecting means, sealant means and said second fluid confining and directing means being fused together to form an integral assembly.

4,049,050

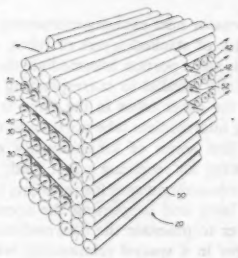
RECUPERATOR STRUCTURES

Donald F. Mold, and Ronald G. Rice, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 554,791, March 3, 1975. This application May 19, 1976, Ser. No. 687,956

Int. Cl.[2] **C03C** *23/20;* **C03B** *32/00;* **F28D** *7/00;* **F28F** *1/00*

U.S. Cl. 165—165 **6 Claims**



1. A recuperator heat exchange assembly, comprising

a. a plurality of stacked layers of elongated tubes extending lengthwise of the recuperator assembly, each tube having open ends and a portion intermediate the open ends which is essentially parallel to the corresponding intermediate portions of the other tubes in the same layer and to corresponding intermediate tube portions in the other layers to form a first series of longitudinally extending parallel passageways for receiving a first fluid, the open ends of at least one end of said tubes in said layers terminating along a line extending obliquely with respect to the longitudinally extending passages thereof;

b. header connecting means at each end of said stacked layers of tubes supporting the opposite open tube ends of each layer to maintain the intermediate tube positions of each layer in a spaced relationship with respect to the intermediate tube portions of the tubes in the adjacent stacked layers in said assembly and to define a second series of passageways between said spaced layers of intermediate tube portions for receiving a second fluid, said header connecting means extending obliquely across tube ends at each end of said stacked layers with respect to said parallel tubes, and closing the spaces between and around the open ends of said tubes to prevent crossflow between the first and second fluid streams;

c. means extending longitudinally along each of the opposite sides of said second series passageways extending between said header connecting means at each end of said stacked layers for confining said second fluid for flow in and through said second series passageways, said side confining means having entry and exit port means formed therein on opposite sides of the recuperator assembly for respectively receiving and discharging the second fluid; and

d. flow directing wall means extending along each second series passageway between said stacked tube layers and parallel therewith, said wall means being spaced laterally inwardly in said second series passageway from said side confining means thereof to guide the second fluid through each second series passageway in paths intermediate said entry and exit ports which are substantially parallel to and in heat exchange relationship with said adjacent tubes;

e. said stacked layers of tubes, header connecting means, wall means, and side confining means having essentially zero porosity, consisting essentially of an inorganic crystalline oxide ceramic material, and having an average coefficient of lineal thermal expansion of about -18 to $+50 \times 10^{-7}$/° C over the range of 0°-300° C;

f. said stacked layers of tubes, said header connecting means, wall means, and said side confining means being fusion bonded together to form an integral assembly.

4,049,051

HEAT EXCHANGER WITH VARIABLE THERMAL RESPONSE CORE

Kenneth O. Parker, Rolling Hills Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 490,833, July 22, 1974, abandoned. This application Jan. 6, 1976, Ser. No. 646,828

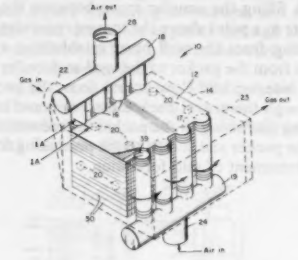
Int. Cl.[2] **F28F** *3/02*

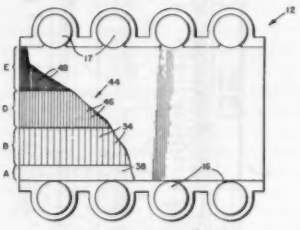
U.S. Cl. 165—166 **5 Claims**

1. In combination with a heat exchanger of the counterflow type having air outlet manifolds and hot gas passages in the core, the improvement comprising:

heat transfer means establishing core thermal response zones of different heat transfer capability for varying the thermal response of the core in the hot gas flow direction to decrease temperature gradients and reduce thermal fatigue of the core, each succeeding zone in the hot gas flow direction having greater heat transfer capability than a preceding zone, and including a zone of degraded thermal

response positioned adjacent the outlet manifolds, and first, second, and third rows of plain fins of increased fin





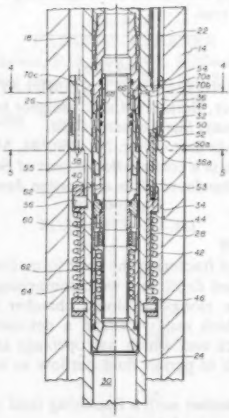
density respectively positioned in the zones succeeding the zone of degraded thermal response.

4,049,052

SUBSURFACE ANNULUS SAFETY VALVE

Henry P. Arendt, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 5, 1976, Ser. No. 673,928
Int. Cl.[2] E21B *23/00, 43/12*
U.S. Cl. 166—183 **17 Claims**



1. An annulus subsurface safety valve for controlling flow in the annulus between concentric well pipes comprising:

mandrel means adapted to be connected in the inner pipe;

packer means extending circumferentially about said mandrel means and adapted to seal with the outer pipe;

passage means by-passing said packer means through said mandrel means;

valve seat means on said mandrel means at the lower end of said passage means;

valve member means axially movable on said mandrel means between a position engaging said valve seat means thereby closing said passage means and a position spaced from said valve seat means thereby opening said passage means and located exterior of said mandrel means upstream from said valve seat means;

means for biasing said valve member means to a position engaging said valve seat means;

chamber means, including pressure responsive means forming a portion of said chamber means;

said pressure responsive means being adapted to move said valve member means to a position spaced from said valve seat means when said chamber means is pressurized; and

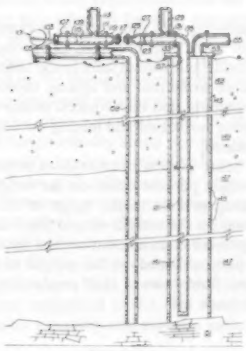
said chamber means being located downstream from said valve seat means in a position to be protected from well fluids in the annulus when said valve member means engages said valve seat means.

4,049,053

RECOVERY OF HYDROCARBONS FROM PARTIALLY EXHAUSTED OIL WELLS BY MECHANICAL WAVE HEATING

Sidney T. Fisher, 53 Morrison Ave., and Charles B. Fisher, 2850 Hill Park Road, both of Montreal, Quebec, Canada

Filed June 10, 1976, Ser. No. 694,700
Int. Cl.[2] E21B *43/24, 43/25*
U.S. Cl. 166—249 **13 Claims**



1. The mechanical wave heating in situ of a selected portion of an underground deposit of hydrocarbons by means of a mechanical wave radiator immersed in a fluid medium which is in direct contact with the said selected portion and located in a well communicating with said selected portion of the deposit, the radiator transmitting mechanical wave energy to the selected portion of the deposit until the selected portion becomes fluid, the said radiator comprising a tube for containing a liquid medium for transmitting mechanical waves, said tube being closed at one end and having connecting means at the other end for connection to a source of mechanical waves, said tube having side walls made of elastic material suitably formed for oscillatory deflection in response to the application of mechanical waves from said source to said liquid medium.

4,049,054

STABLE MIXTURES OF POLYMERS AND SURFACTANTS FOR SURFACTANT FLOODING

Donald R. Wier, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 531,158, Dec. 9, 1974, abandoned. This application Oct. 8, 1976, Ser. No. 730,773

Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—273 **12 Claims**

1. A method of preparing a stable surfactant waterflooding fluid comprising:

dissolving a polymer selected from the group consisting of a high molecular weight copolymer of acrylamide or methacrylamide with an alkali metal or ammonium salt of acrylic or methacrylic acid, carboxymethyl cellulose, or a heteropolysaccharide produced by fermentation of carbohydrates by bacteria of the genus Xanthomonas in water;

thereafter combining said thus-formed polymer solution and a solution of a salt selected from the group consisting of sodium chloride and sulfate salts in the absence of a petroleum sulfonate surfactant and mixing thoroughly; and

thereafter combining said thus-formed mixture with a petroleum sulfonate surfactant and mixing until a homogeneous fluid is obtained,

said polymer being present in an amount within the range of 0.01 to 5 weight percent based on the weight of said fluid, said salt being present in an amount within the range of 0.1 to 10 weight percent based on the weight of said fluid, and said surfactant being present in an amount within the range of 0.01 to 10 weight percent based on the weight of said fluid.

11. A process for recovering crude oil from an oil-bearing subterranean formation having at least one injection means in fluid communication with at least one production means, comprising: injecting into the formation a surfactant waterflooding fluid made by:

dissolving a polymer selected from the group consisting of a high molecular weight copolymer of acrylamide and sodium acrylate, carboxymethyl cellulose, or a heteropolysaccharide produced by fermentation of carbohydrates by bacteria of the genus xanthomonas in fresh water;

thereafter combining said thus-formed polymer solution and a solution of a salt selected from the group consisting of sodium chloride and sulfate salts in the absence of a petroleum sulfonate surfactant and mixing thoroughly; and

thereafter combining said thus-formed mixture with a petroleum sulfonate surfactant and mixing until a homogeneous fluid is obtained;

said polymer being present in an amount within the range of 0.01 to 5 weight percent based on the weight of the fluid, said salt being present in the range of 0.1 to 10 weight percent based on the weight of said fluid, and said surfactant being present in an amount within the range of 0.01 to 10 weight percent based on the weight of said fluid; and

displacing said fluid toward said production means to recover said crude oil.

4,049,055

GRAVEL PACK METHOD, RETRIEVABLE WELL PACKER AND GRAVEL PACK APPARATUS

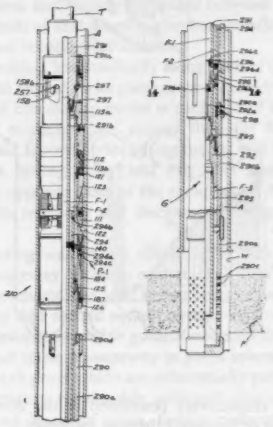
Joe R. Brown, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.

Filed Apr. 30, 1971, Ser. No. 139,006

Int. Cl.[2] E21B *23/04, 23/06, 33/129, 43/04*

U.S. Cl. 166—278 **43 Claims**

40. A method of treating a well for production which includes lowering an operating tool string having connected thereto a packer having a screen supported therebelow into the well bore; seating the packer in sealing position in the well bore above a producing formation therein with the screen in communication with the producing formation; opening a flow path for circulation downwardly past the packer and the screen to the producing formation and upwardly past the screen and the packer to the well surface for treating the well formation; introducing gravel through said circulation flow path into the well bore below the packer exteriorly of the screen to form a gravel pack filling the annular space between the screen and the well bore to a point above the screen; removing the operating tool string from the well bore; establishing a production flow course from the packer to the well surface for conducting well fluids entering said flow course from the producing formation through the gravel pack and screen; and reconnecting the operating tool string to the packer for reestablishing a flow path past the packer and screen to the producing formation for additional treatment of said formation.



41. An operating tool for setting a packer and screen in place in a well and establishing a circulation path through the packer and screen in place including: means for connecting said operating tool to said packer for setting the same in the well; means for establishing a flow path through the set packer and screen to the exterior of the screen; means for establishing a circulation path through the packer and the screen downwardly from the surface and upwardly to return to the surface; means for closing off the circulation path; and means for opening the circulation path by movement of an operating string connected to the operating tool.

4,049,056

OIL AND GAS WELL STIMULATION

Charles S. Godfrey, Berkeley, Calif., assignor to Physics International Company, San Leandro, Calif.

Continuation-in-part of Ser. No. 250,184, May 4, 1972, abandoned, which is a continuation-in-part of Ser. No. 138,618, April 29, 1971, abandoned. This application June 28, 1976, Ser. No. 700,470

Int. Cl.[2] E21B *43/26*

U.S. Cl. 166—299 **17 Claims**

1. A method of fracturing the rock formation at a pay zone at a predetermined depth in a well, comprising:

establishing an elongated closed chamber in said well of material which can withstand a detonation which can fracture rock and which has openings at said predetermined depth to permit fluid outflow to said rock formation,

filling said chamber with a fracturing fluid to a level above said predetermined depth,

applying a shock wave to said fracturing fluid, which has a rise time faster than the time required for sound to traverse one half of the periphery of the well opening in said rock at said pay zone, and which when applied to said rock by said fluid has an amplitude which will fracture said rock but which is less than the amplitude required to crush said rock, whereby said rock formation at said

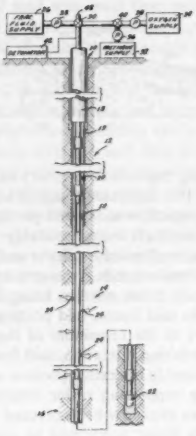
predetermined depth is fractured and fluid is forced into the fractures.

4. Apparatus for stimulating a well that has a casing which can withstand a rock fracturing detonation, and which has a pay zone with rock formation exposed through the casing to permit fluid access to said rock formation, comprising:

a source of a fracturing fluid,

means to transfer said fracturing fluid from said source into said well to a level above said pay zone,

means for rendering the portion of said well including said fracturing fluid gas tight, and



means for applying a shock wave to said fracturing fluid, which has a rise time faster than the time required for sound to traverse one half of the periphery of the well opening in said rock at said pay zone, and which when applied to said rock by said fluid has an amplitude which will fracture said rock but which is less than the amplitude required to crush said rock, whereby said rock formation at said predetermined depth is fractured and fluid is forced into the fractures.

4,049,057

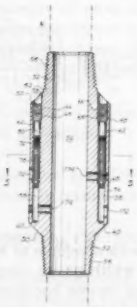
PARAFFIN CLEANER

William Stan Hewes, P.O. Box 3051, Midland, Tex. 79701

Filed Sept. 30, 1976, Ser. No. 728,298

Int. Cl.[2] E21B *37/00*

U.S. Cl. 166—304 **7 Claims**



4. In an offshore oil well having

a. an eduction tube, within

b. a casing;

AN IMPROVED METHOD OF TREATING A WELL FROM WITHIN THE EDUCTION TUBE WITHOUT POLLUTING THE ENVIRONMENT COMPRISING:

c. placing

i. an in pressure relief valve for flow from the annulus of the casing into the tubing adjacent to

ii. an out pressure relief valve for flowing from the tubing into the annulus,

d. pumping treatment fluids into the eduction tube, thus

e. opening the out pressure relief valve so that the eduction tube contents are pumped into the annulus between the tube and casing, then

f. pumping neutral fluids into the annulus, thus

g. opening the in pressure relief valve so that the eduction tube contents are returned thereto.

4,049,058

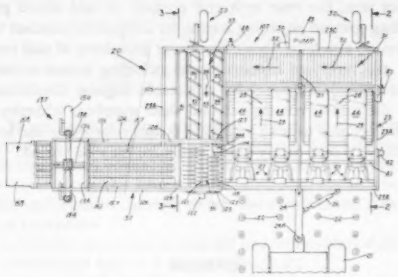
SUGAR BEET HARVESTER

Fred W. Eisenhardt, Fargo, N. Dak., and Wayne S. Tonsfeldt, Savin, Minn., assignors to Alloway Manufacturing, Inc., Fargo, N. Dak.

Filed Aug. 28, 1975, Ser. No. 608,741

Int. Cl.[2] A01D *19/00*

U.S. Cl. 171—58 **45 Claims**



1. A machine for lifting sugar beets from the soil and delivering sugar beets to a selected location comprising: a movable frame, means mounted on the frame for lifting sugar beets rearwardly from the means for lifting beets, second conveyor means mounted on the frame for receiving sugar beets from the first conveyor means and moving the sugar beets transversely of the machine, a grab roller assembly having a plurality of rollers located longitudinally along one side of the frame, said grab roller assembly having an input end and a discharge end, means mounting the grab roller assembly along said one side of the frame, said second conveyor means operable to deliver sugar beets to the input end of the grab roller assembly, elevator means mounted on said one side of the frame for receiving sugar beets from the discharge end of the grab roller assembly and delivering the sugar beets to an elevated selected location, and drive means connected to the first and second conveyor means, grab roller assembly and elevator means to operate the same.

4,049,059

COMBINED GARDEN CULTIVATOR AND LAWN EDGER

Robert L. Weibling, 5041 E. Lake Road, Sheffield Lake, Ohio 44054

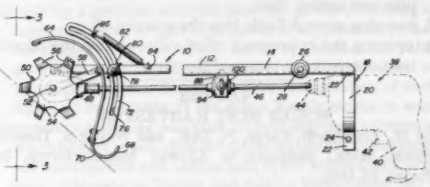
Continuation-in-part of Ser. No. 616,877, Sept. 25, 1975, abandoned. This application June 17, 1976, Ser. No. 696,841

Int. Cl.[2] A01B *1/00;* **A01G** *3/06*

U.S. Cl. 172—15 **13 Claims**

1. In combination, an elongated inclined support arm including forward lower and rear upper ends, a rotary shaft member journaled from the lower end of said support arm for rotation about a horizontal transverse axis, motor support means on the other upper end of said support arm for supporting motor

means including a rotatable output shaft, said support arm including rotary torque transmitting means having a first portion drivingly connected to said rotary shaft member and a second portion adjacent said other upper end of said support arm adapted to be driven by the rotatable output shaft of motor means supported from said support means, a rotary blade structure mounted on one end of said rotary shaft member to one side of said one end of said support arm, an arcuate shield panel, support means supporting said panel in position partially



embracingly encircling said rotary blade structure and opening toward the latter away from said other end portion of said support arm, the rear arch end portion of said shield panel including ground engaging means for supportive contact with the ground at a level above the lower periphery of said rotary blade structure, said support means including means mounting said arcuate shield panel for adjustable angular displacement about the axis of rotation of said shaft member, whereby the elevation of said ground engaging means relative to said lower periphery of said rotary blade structure may be varied.

4,049,060

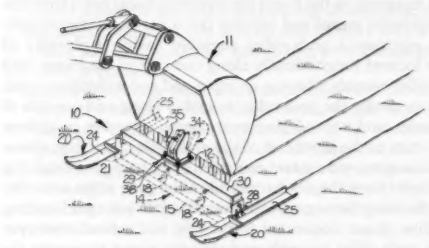
SOD CUTTER

Clyde Rockwell Hoke, Rte. 3, Box 505, Statesville, N.C. 28677

Filed June 11, 1976, Ser. No. 695,078

Int. Cl.[2] A01B *45/04*

U.S. Cl. 172—19 10 Claims



1. Sod cutting apparatus for attachment to an excavating machine such as a backhoe and comprising elongate blade means for cutting a surface layer from the earth, depth control means operatively connected with said blade means for positioning the same substantially parallel to the surface of the earth, and mounting means operatively connected with said blade means and said depth control means for detachable engagement with a portion of an excavating machine and comprising crossbar means spanning said blade means and pivotally connected thereto for accommodating varying angulations of the excavating machine with respect to the surface of the earth whereby movement of the excavating machine adjacent the surface of the earth moves said depth control means across the surface and said blade means through the earth and cuts a surface layer therefrom.

4,049,061

ROTARY HARROWS

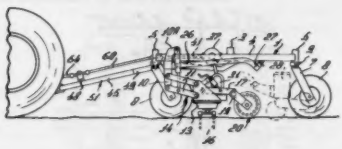
Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Filed Aug. 6, 1975, Ser. No. 602,467

Claims priority, application Netherlands, Aug. 6, 1974, 7410530

Int. Cl.[2] A01B *33/06*

U.S. Cl. 172—49 5 Claims



1. A soil cultivating implement or rotary harrow comprising a frame and at least two separate groups of soil working members supported on respective elongated portions of said frame, said soil working members being rotatably mounted on upwardly extending axes afforded by shafts and said shafts being positioned in a row that extends transverse to the direction of operative travel, each frame portion being hollow and independently pivoted to said frame, said portion being vertically displaceable relative to the remainder of the frame to match ground undulations during operation, said frame portion being at least partly sustained in operative position above the ground by a corresponding supporting roller coupled to that frame portion, at least three ground wheels pivoted to said frame and said ground wheels being positioned to support said frame during operation, driving means connected to a corresponding gear box of each said group and said gear box containing transmission parts that engage the shafts of the soil working members of said group, said frame including a leading beam and rearwardly extending arms being pivotably connected to that beam, tool bar means on the ends of said arms and said tool bar means being positioned to support additional tools at the rear of the rollers.

4,049,062

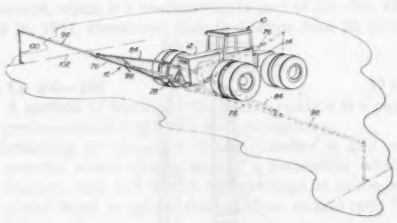
SWING MOUNT PIVOTALLY SUPPORTING WIDTH GAUGE FROM VEHICLE

Lawrence E. Rossmiller, and George D. Gemar, both of Brady, Mont. 59416

Filed Aug. 27, 1975, Ser. No. 608,236

Int. Cl.[2] A01B *35/32*

U.S. Cl. 172—126 3 Claims



1. In combination with a vehicle to be used in pulling wide trailing structures, a width gauge comprising an upstanding mount frame including remote horizontally spaced inner base and outer free marginal portions, a central forward portion of said vehicle including mounting means mounting said frame at said base marginal portion thereof for oscillation of said frame relative to said vehicle about a first upstanding axis between positions with said free marginal portion disposed adjacent and facing outwardly of opposite sides of said vehicle, an elongated

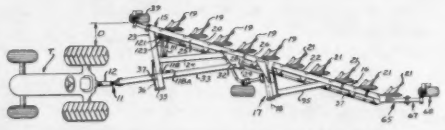
horizontal arm having an inner base end and an outer free end, said base end of said arm and free marginal portion of said frame including first coacting means pivotally supporting an upper portion of said base end from an upper portion of said free marginal portion to define an upstanding upper pivot connection, said free marginal portion including first and second lower mounting portions spaced horizontally apart on opposite sides of the medial plane of said frame and inwardly of said first coacting means in the direction of said inner base marginal portion, said base end portion including first and second lower support portions spaced horizontally apart on opposite sides of said arm, said first mounting and support portions and said second mounting and support portions defining releasably and alternately engageable means defining first and second upstanding lower pivot connections, respectively, on opposite sides of said arm and frame, said first coacting means and said lower mounting and support portions collectively defining a shiftable upstanding axis to be canted between positions alternately aligning said first coacting means with said first and second lower pivot connections to respectively define oppositely inclined axes about which said arm may be oppositely swung relative to said frame from a horizontal center position projecting outwardly from said free marginal portion toward rearwardly and upwardly inclined positions extending along said opposite sides of said vehicle, when said free marginal portion of said frame is disposed at said opposite sides of said vehicle.

4,049,063

MULTI-UNIT ADJUSTABLE PLOW SYSTEM

William John Dietrich, Congerville, Ill., assignor to DMI, Inc., Goodfield, Ill.

Filed Sept. 29, 1975, Ser. No. 617,892
Int. Cl.[2] A01B *69/00*
U.S. Cl. 172—283 **8 Claims**



1. In a plow system adapted to be pulled by a traction vehicle having a rear wheel, sid plow system having a frame with an inclined beam, a plurality of plow units mounted on said inclined beam and connected together for rotation in unison to adjust the cutting width of the plows, and power adjustment means for adjusting the width of said plow units, the improvement comprising:

a front furrow wheel mounted adjacent the forward end of said inclined beam and adapted to ride in a previously formed furrow;

a tongue pivotally connected at its forward end to a hitch on said vehicle and pivotaly connected at its rear end to said frame;

means for slidably supporting a portion of said frame on said tongue; and

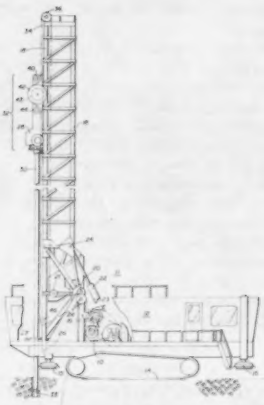
link means pivotally interconnecting said tongue and said adjustment means for rotating said frame relative to said tongue responsive to the adjustment of said plow units such that the distance between said forward furrow wheel and said rear wheel of said vehicle remains constant over a continuous range of width adjustments for said plow units.

4,049,064

MULTI FUNCTION DRILL DRIVE SYSTEM

Raymond L. Chubb, Garland; Lawrence F. Haven, Dallas, and Robert W. Hisey, Richardson, all of Tex., assignors to Gardner-Denver Company, Dallas, Tex.

Filed Apr. 30, 1976, Ser. No. 682,355
Int. Cl.[2] B23Q *5/00*
U.S. Cl. 173—147 **4 Claims**



1. In an earth drilling apparatus having an elongated upstanding mast and a drive means to drive a drill pipe through a traverse means connected to the drill pipe and mounted for movement along the length of the mast to transmit hoist and pulldown forces to the drill string, the combination therewith which comprises:

a. a variable speed motor coupled in driving relation through a reduction unit to a high torque shaft,

b. a clutch shaft driven in accordance with the input to said reduction unit,

c. a first clutch for driving an output shaft in accordance with said clutch shaft,

d. means for driving said traverse means in accordance with said output shaft,

e. a second clutch for alternatively driving said output shaft from said high torque shaft, and

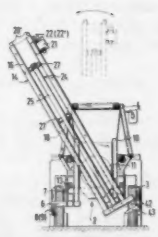
f. means for changing the operating mode of said motor and shifting energization from one of said clutches to the other.

4,049,065

DRILLING APPARATUS

Hans-Philipp Walter, 22 Oderstrasse, D-3570 Stadt Allendorf 1, Germany

Filed July 16, 1975, Ser. No. 596,551
Claims priority, application Germany, July 24, 1974, 2435535
Int. Cl.[2] E21B *19/14*
U.S. Cl. 175—52 **13 Claims**



1. A drilling apparatus comprising:

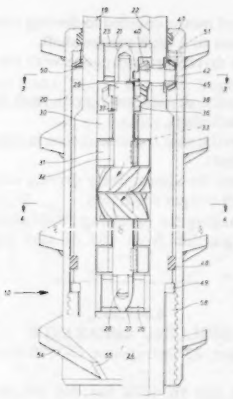
a. a mobile base support structure,
b. a drilling tower supported on said support structure,
c. a bearing means upon which said tower is mounted on a horizontal axis, said bearing means permitting adjustment of said drilling tower in a transverse direction relative to said horizontal axis,
d. a drilling head mounted on said drilling tower so that the drilling head can move along the length of said drilling tower,
e. rotary driving means for a drill rod mounted on said drilling head,
f. a storage means included in said drilling tower for receiving a plurality of drill rods in a parallel arrangement of rotational symmetry, said drill rods having cone thread ends for the formation of a drill string and being adapted to be singly handled, said storage means including
1. a revolving rack means which is mounted centrally with respect to said drilling tower, and
2. means for rotating said rack means in arcuate increments so as to permit both the transfer of drill rods out of said rack means and into said rack means, and
g. nesting means associated with said revolving rack, said nesting means including grapplers having spreader arms and transverse drive means, said spreader arms and transverse drive means being adapted to cooperate to transfer drill rods into and out of said rack.

4,049,066

APPARATUS FOR REDUCING ANNULAR BACK PRESSURE NEAR THE DRILL BIT

Vernon T. Richey, 1111 Blalock, Apt. 160, Houston, Tex. 77055

Filed Apr. 19, 1976, Ser. No. 677,926
Int. Cl.[2] E21B *17/00*
U.S. Cl. 175—323 **10 Claims**



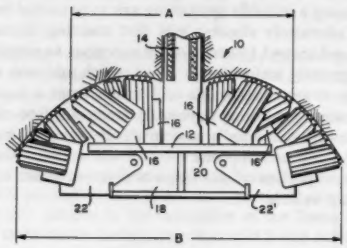
1. An annular mud pump for use in a drill string in drilling a well bore which is adapted to be located above the drill bit in the drill string and which comprises:
an elongate tubular member adapted to be connected in a drill string at the upper end and further adapted to be located above a drill bit attached at the lower end of the drill string;
a second tubular member positioned concentrically about the first tubular member;
motor means in said first tubular member, said motor means being positioned and exposed to the flow of mud therethrough flowing through the drill string and said tubular member, said motor means having a set of blades which are rotated by the mud flow and which rotates an output shaft;
gear means connected to the output shaft of said motor means;
a gear connected to said second tubular member and comprising a portion of said gear means said gear being fixed to said outer tubular member for rotating the second tubular member in response to operation of said motor means; and
a multiflite screw on the exterior of said second tubular member which is rotated in the annulus of the well bore in a direction to lift drilling mud by the flites of the said screw.

4,049,067

CUTTER MOUNTING EXTENSION APPARATUS

Charles R. Dively, Seattle, Wash., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 5, 1975, Ser. No. 629,052
Int. Cl.[2] E21B *9/22*
U.S. Cl. 175—406 **25 Claims**



1. Cutter mounting extension apparatus, for use in extending the radius of a raise boring head having a drive stem, comprising:
extension support means having means adapted for a coupling thereof to a raise boring head; and
a cutter mounting extension element coupled to said support means; wherein
said extension support means comprises a planar base having a pair of opposed sides;
said extension element comprises a flat plate;
said extension element is coupled to said base at one of said sides thereof;
said base and said plate being in abutting relationship and occupying a common plane; and
fastening means replaceably securing said base and said plate together and prohibiting relative displacement, between said base and said plate, from said common plane.

4,049,068

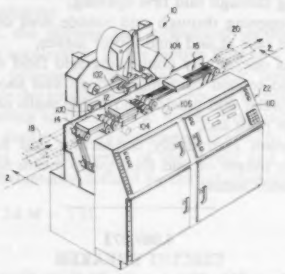
PRICE LABELING SYSTEM WITH FLOATING ZERO REFERENCE

George Kavanagh, Ithaca, N.Y., and John L. Caron, Oakland, Calif., assignors to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed May 3, 1976, Ser. No. 682,852
Int. Cl.[2] G01G *11/04*
U.S. Cl. 177—25 **14 Claims**

1. In a high speed weight computing system, in combination:
weight-sensitive means for producing an output signal in response to weight acting thereon;
conveyor means for conveying articles along a path passing over said weight-sensitive means and including control means for transiently depositing said articles on said weight-sensitive means;
sensor means for actuating said control means transiently to deposit an article on said weight-sensitive means; and
computer means interfaced with said sensor means and with said weight-sensitive means for computing the gross weight of an article based upon the difference in outputs of said weight-sensitive means when an article is tran-

siently deposited on the weight-sensitive means and when the article is not on the weight-sensitive means, said weight-sensitive means producing an analog output signal linearly proportional to weight, and including amplifier means connected to the analog output signal, and an analog-to-digital converter connected to the output of the amplifier means, said amplifier means amplifying the output signal to produce a difference in digital outputs from said converter which represents the measured load times a factor *m* and said computer means computing said gross weight on the basis of said difference in output signals divided by said factor *m* whereby to minimize weight computation errors due to converter inaccuracy in converting to the least significant bit of the output thereof.

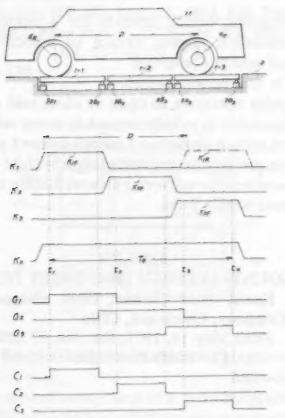


4,049,069

DEVICE FOR WEIGHING RUNNING VEHICLE

Ryozo Tamamura, Osaka, and Masami Yamanaka, Miki, both of Japan, assignors to Yamato Scale Company, Limited, Japan

Filed May 5, 1976, Ser. No. 683,048
Claims priority, application Japan, Aug. 26, 1975, 50-103861
Int. Cl.[2] G01G *19/02*
U.S. Cl. 177—134 **3 Claims**



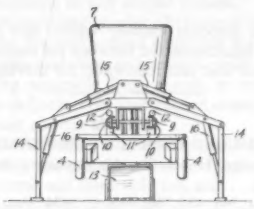
1. A device for weighing moving vehicles having the maximum number *n* l *and the minimum distance D of wheel axles, comprising M weighing platforms arranged serially on a road surface along the running direction of said vehicles, the dimension of said weighing platforms being less than said minimum distance D of wheel axles, M electromechanical converting means for producing electric signals which are respectively proportional to the loads applied respectively onto said weighing platforms, N adder circuits connected respectively to the outputs of said converting means for summing up the outputs of said converting means, where N is equal to or greater than n,* N groups of gate circuits, each group consisting of M gate circuits inserted respectively between said converting means and adder circuits for effecting separate conduction control of the outputs of said converting means, N averaging circuits for calculating average loads from the outputs of said adder circuits respectively, and a control circuit for controlling said gate circuits such that said groups of gate circuits pass exclusively the load signals corresponding to the respective wheel axles.

4,049,070

EXCAVATOR HAVING LIFTING LEGS AND COOPERATING BOOM MOUNTED BUCKET FOR "WALKING"

Ingebret Soyland, Solhogda 2 Brynehaugen, Bryne, Norway (N-4340)

Filed July 18, 1975, Ser. No. 597,228
Claims priority, application Norway, July 19, 1974, 742642
Int. Cl.[2] B62D *57/00*
U.S. Cl. 180—8 C **3 Claims**



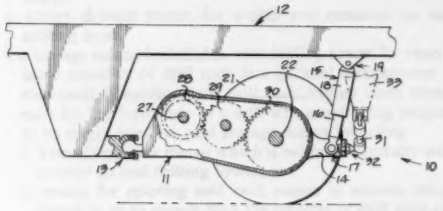
1. an excavator, comprising:
frame means having wheel means thereon;
rail means mounted on said frame means;
a rail carriage mounted on said rail means, and movable along the longitudinal axis thereof;
first motive means connected between said rail carriage and said rail means, operable to effect movement of said rail carriage along the longitudinal axis of said rail means;
a boom and bucket assembly carried by said rail carriage, and including a second motive means operable separate from said first motive means to move said boom and bucket in a generally vertical plane to engage said bucket with the earth, said generally vertical plane including the longitudinal axis of said rail means; and
a lifting leg assembly mounted on each of the opposite sides of said rail carriage to project laterally from the longitudinal axis thereof, each of said lifting leg assemblies including a third motive means operable separate from said first and said second motive means to press the lower end of the associated leg assembly against the ground,
said third motive means of said lifting leg assemblies and said second motive means of said boom and bucket assembly being operable separately but cooperatively to engage all three of said bucket and said laterally projecting leg assemblies with the ground to lift said wheel means on said frame means to a height spaced above the ground, whereupon said first motive means connected between said rail carriage and said rail means can be operated separately to move said frame means relative to said rail carriage to thereby move said wheel means to a different location.

4,049,071

MODULAR DUAL WHEEL SUSPENSION AND DRIVE ARRANGEMENT FOR TRUCKS

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 8, 1976, Ser. No. 664,849
Int. Cl.[2] B62D *61/10*
U.S. Cl. 180—24.05 **11 Claims**



1. A modular axle suspension and drive arrangement attached to a main frame of a vehicle comprising

a hollow sub-frame, said main frame at least partially overlying said sub-frame,

connection means universally pivoting a forward end of said sub-frame to a rearward end of said main frame,

a drive motor, having an output shaft, mounted on said sub-frame,

at least one roadwheel rotatably mounted on said sub-frame, and

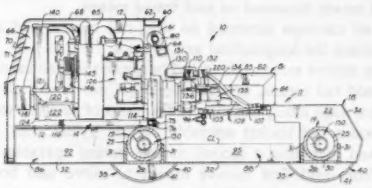
drive means disposed entirely within said sub-frame and drivingly interconnected between the output shaft of said drive motor and said roadwheel for driving the same.

4,049,072

MODULAR VEHICLE SUBASSEMBLY

Donald D. Savage, Huntsville, Ala., assignor to B. J. Powell, Atlanta, Ga.

Division of Ser. No. 439,736, Feb. 5, 1974, Pat. No. 3,907,053. This application Sept. 23, 1975, Ser. No. 616,028
Int. Cl.[2] B60K *5/10*
U.S. Cl. 180—64 M **2 Claims**



1. A modular vehicle subassembly comprising:

a base frame including a pair of spaced apart tubular side rails, each of said side rails having spaced apart inside and outside walls, and defining a prime mover enclosure, a first space, and a second space therein, said base frame further including a pair of spaced apart and opposed slide rails mounted on said side rails within said enclosure;

a prime mover module including an undercarriage movably supporting said module on said slide rails within said enclosure;

a first fluid tank removably mounted in said first space;

a second fluid tank removably mounted in said second space, and connected to said prime mover module;

locating means for selectively and releasably fixing said prime mover module in said enclosure;

fluid motor means carried by said base frame outside of said side rails adjacent said outside walls;

fluid pump means having an output connected to and driven by said prime mover module, said fluid pump means operatively connected to said first fluid tank;

a first coupling inside of said inside wall of one of said side rails;

a first opening defined through said inside wall of said one of said side rails in registration with said first coupling;

a second coupling between said inside and said outside walls of said one of said side rails releasably engaging said first coupling through said first opening;

a second opening through said outside wall of said one of said side rails at said fluid motor means;

first means operatively connecting said fluid motor means with said second coupling through said second opening and between said outside and inside walls of said one of said side rails; and,

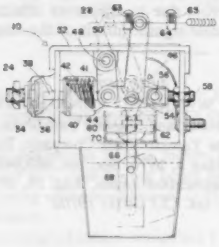
second means operatively connecting said first coupling with the output of said fluid pump means to power said fluid motor means.

4,049,073

CIRCUIT BREAKER

Meril D. Gebert, 560 - 30th Ave. Sp. 37, Santa Cruz, Calif. 95060

Filed Apr. 5, 1976, Ser. No. 673,723
Int. Cl.[2] B60K *28/00*
U.S. Cl. 180—103 A **6 Claims**



1. An automatic circuit breaker for a vehicle having an internal combustion engine having an associated electrical power circuit which comprises

a switch in said power circuit,

a toggle joint operative to open or close said switch, and

means responsive to vehicle impact to move said toggle joint between switch-closed and switch-opened positions,

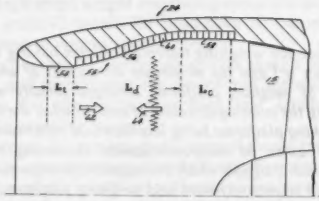
said toggle moving means including a weight supported by rigid members for universal pivotal motion to contact and move said toggle joint.

4,049,074

SOUND-ATTENUATING INLET DUCT

Stephen B. Kazin, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed May 14, 1975, Ser. No. 577,293
Int. Cl.[2] F04B *39/00*; B64D *33/06*
U.S. Cl. 181—286 **5 Claims**



1. In a gas turbine engine of the type having rotatable com-

pression means adapted to pressurize a motive fluid there is provided a sound-attenuating inlet duct comprising:

causing means open at opposing ends to accommodate the passage of the motive fluid therethrough and defining, in serial flow relationship, a throat of predetermined axial extent, a diffuser and a generally cylindrical section ahead of the compression means; and

acoustic treatment disposed upon and within said casing means, wherein

the throat, the diffuser and cylindrical section geometry cause an acceleration of the motive fluid to a higher axial velocity proximate the casing acoustic treatment than proximate the rotational axis to provide sound attenuation by imparting to the acoustic waves propagating through the inlet duct a velocity component normal to the acoustic treatment, the geometry of the throat and the diffuser being substantially defined by the relationships:

$$L_d/D = 2.6\,M - 1.12,$$

and

$$L_t/D = 1.28 - 1.6\,M,$$

wherein

D = diameter of the cylindrical section;

L_d = axial extent of the diffuser;

L_t = axial extent of the throat; and

M = average throat Mach number substantially between 0.7 and 0.8.

4,049,075

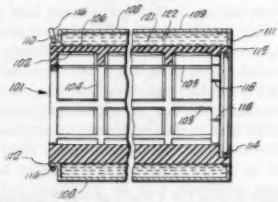
SOUND DAMPING APPARATUS

Milo E. Murphy, Long Beach, Calif., assignor to Murphy Muffler, Inc., Los Angeles, Calif.

Division of Ser. No. 408,388, Oct. 23, 1973, Pat. No. 3,918,549. This application Nov. 6, 1975, Ser. No. 629,681

Int. Cl.² F01N 1/22

U.S. Cl. 181—220 **3 Claims**



1. A sound damper for gas streams emerging from a ported periphery comprising:

a resilient first wall comprised of a cylindrical sheath of gas impervious material surrounding said periphery, said first wall including end portions extending between said sheath and said periphery defining a first volume into which said gas streams emerge;

a rigid second wall concentrically surrounding said first wall defining a closed second volume between said first and second walls;

a fluid filling said second volume;

means for securing one of said end portions in gas tight relation to said periphery; and

the other of said end portions resilient opening in response to gas pressure to define intermittent gas exit means.

4,049,076

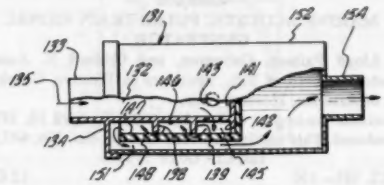
SOUND DAMPING APPARATUS

Milo E. Murphy, Long Beach, Calif., assignor to Murphy Muffler, Inc., Los Angeles, Calif.

Division of Ser. No. 408,388, Oct. 23, 1973, Pat. No. 3,918,549. This application Nov. 6, 1975, Ser. No. 629,682

Int. Cl.² F01N 1/08

U.S. Cl. 181—224 **1 Claim**



1. A sound damper for use with gas streams, comprising:

a resilient cylindrical sheath first wall of gas impervious material defining a first volume,

a rigid second wall defining a second volume, said second wall being surrounded by and concentric with said first wall, said second wall having gas ports therein connecting said first and second volumes,

a tube fixed to the second rigid wall and defining a gas entry means connecting to said second volume,

contact means including annular ribs integral with a wall and between the first and second walls and dividing the volume between said first and second walls, said contact means being separable from a wall in response to gas pressure to define intermittent gas exit means between said wall and said contact means,

a third rigid wall about said resilient wall and defining a third volume, said gas exit means intermittently connecting said second and third volumes, and

a gas exit tube on said third wall.

4,049,077

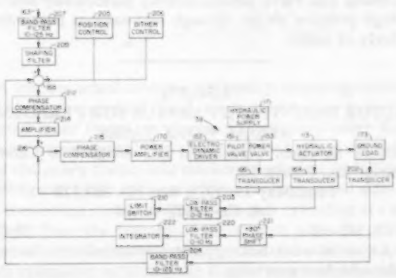
SEISMIC VIBRATOR CONTROL SYSTEM

Joseph F. Mifsud, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Continuation of Ser. No. 516,329, Oct. 21, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,502

Int. Cl.² G01V 1/04

U.S. Cl. 181—114 **31 Claims**



1. An improved apparatus for controlling the operation of seismic vibrator, said vibrator including a coupling plate, the movement of which is responsive to an electrical input signal, the improvement comprising a feedback loop which includes:

means for generating an electrical feedback signal which includes a transducer coupled to said coupling plate, said feedback signal having an amplitude which varies instantaneously with coupling plate motion;

summing means having said electrical input signal connected to a first input terminal thereto and said feedback signal having an amplitude which varies instantaneously with coupling plate motion connected to a second input terminal thereto; and

phase compensator means connected in series circuit relation within said feedback loop.

4,049,078

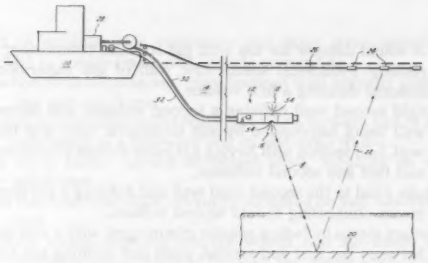
MARINE ACOUSTIC PULSE TRAIN SIGNAL GENERATOR

John Lloyd Paitson, Galveston, and Clifford E. Anderson, Huntsville, both of Tex., assignors to Western Geophysical Co. of America, Houston, Tex.

Continuation-in-part of Ser. No. 460,867, April 15, 1974, abandoned. This application Jan. 8, 1976, Ser. No. 647,549

Int. Cl.² G01V *1/04*

U.S. Cl. 181—120 **12 Claims**



1. An air gun for generating a train of discrete acoustic pulses in a body of water at a desired pulse repetition rate during a single recording cycle of predetermined length comprising:

a housing defining a supply chamber for receiving a volume of high pressure air, the housing including an inlet and at least one exhaust port fluidly communicating, in use, with said body of water;

sliding valve means mounted in said housing between said supply chamber and said exhaust port;

reciprocatingly mounted, rigid linkage means fixedly secured to said sliding valve means;

control means for continuously varying the repetition rate of said pulses from 5 to at least 40 Hertz, thereby to define a seismic chirp signal; and

drive means mechanically connected to said linkage means and cooperating with said control means for opening and closing said valve means, thereby periodically emitting a high pressure air jet through said exhaust port into said body of water.

4,049,079

TRACTOR MOUNTED APPARATUS FOR PERFORMING AERIAL WORK TASKS

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 19, 1976, Ser. No. 687,728

Int. Cl.² B66F *11/04*

U.S. Cl. 182—2 **20 Claims**

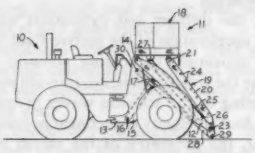
1. An aerial work task apparatus mounted on a frame of a mobile vehicle comprising

lift arm means pivotally mounted directly on said frame,

lift cylinder means pivotally interconnected between said frame and said lift arm means for selectively moving said lift arm means between lowered and raised positions relative to ground level,

platform means adapted to carry a workman thereon and

linkage means pivotally interconnected between said frame, said lift arm means and said platform means for raising and lowering said platform means at least substantially vertically above said vehicle and for at least substantially maintaining said platform means parallel relative to ground level upon raising and lowering thereof, said linkage means being universally connected to said platform means and wherein said linkage means comprises adjustment means for selectively moving said platform means relative to said vehicle in pitch, roll and yaw directions for universal movement, first linkage means pivotally connected to said lift arm means and universally connected at a single point connection to said platform means and second linkage means, forming a parallelogram-type linkage with said first linkage means, pivotally connected to said lift arm means and universally connected to said platform means at a two point connection thereon.



4,049,080

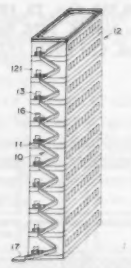
ESCAPE DEVICE FOR A MULTI-STOREY BUILDING

Yoshio Suzuki, 529 Futago, Takatsu, Kawasaki, Kanagawa, Japan

Filed Apr. 14, 1976, Ser. No. 676,694

Int. Cl.² A62B *1/20*

U.S. Cl. 182—48 **6 Claims**



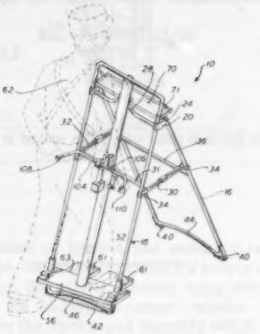
1. An escape device for a multi-storey building having emergency exits in the outer side wall of each of the storeys of said building, said escape device comprising a plurality of support brackets secured to said outer side wall of the building storeys, a downwardly inclined main body including a plurality of straight sections connected integrally together by means of outwardly curved corner sections to provide a meandering chute construction to said main body and supported by said support brackets, evacuation openings provided adjacent the lower ends of alternate straight sections of said plurality of straight sections and positioned adjacent said emergency exits, a plurality of pulleys mounted on the bottom of said main body in two parallel rows at a plurality of spaced positions along the length of the main body, ropes guided over said rows of pulleys, and a shock absorbing means provided at the lower end of the lowermost straight section of said plurality of straight sections.

4,049,081

OPERATOR-ACTUATED ELEVATING DEVICE

Walter McDonald, 558 Dell Road, Landing, N.J. 07850; Norbert F. Seitel, 45 Gilette Place, Gilette, N.J. 07933, and John E. Ayres, 540 Fairview Ave., Westwood, N.J. 07675

Filed Jan. 12, 1976, Ser. No. 648,384
Int. Cl.[2] E06C 7/12; B66B 9/20
U.S. Cl. 182—148 7 Claims



1. An elevatable operator-actuated lifting platform, comprising in combination:

a lower support frame;

a platform section including means for supporting said operator, telescopically interfitted with said support frame as to be elevatable with respect thereto;

hydraulically actuated piston and cylinder means, for telescoping and de-telescoping said platform section away from and toward said support frame, to enable elevation and lowering of said platform section;

said piston and cylinder means including a cylinder associated with and fixed with respect to one of said support frame and platform, and a piston fixed with respect to the other of said frame and platform; said piston being received within said cylinder and being axially displaceable outwardly from said cylinder by pressurization thereof to enable said elevation of said platform;

means moveable with said platform for manually pressurizing and de-pressurizing said piston and cylinder means with said fluid, to enable raising and lowering of said platform by said operator;

and wherein said manually actuated means moveable with said platform includes a reservoir of hydraulic fluid and a manually operable pumping means for providing said fluid to said cylinder; a first flow path being defined between said reservoir and said cylinder including said manually operable pumping means for effecting elevation of said platform section by pressurization of said cylinder; a second flow path being defined between said reservoir and pressurized cylinder for enabling return of fluid to said reservoir for lowering of said platform; and manually operable valve means moveable with said platform section for enabling operator selection between said first or second flow paths.

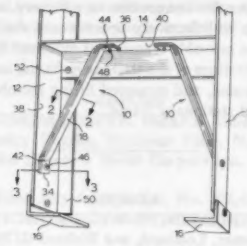
4,049,082

STRUCTURAL MEMBER FOR A STRUCTURAL FRAME

Robert Reid, Mississauga, Canada, assignor to Daymond Limited, Mississauga, Canada

Filed Dec. 9, 1975, Ser. No. 639,054
Int. Cl.[2] E06C 7/10
U.S. Cl. 182—217 9 Claims

1. In a ladder frame, a structural member of malleable metal comprising a substantially planar wall and two opposing irregular-shaped sidewalls which are integral with substantially parallel edges of said substantially planar wall, each of said irregular-shaped sidewalls having a corrugation therein which extends along the length of each sidewall, said member having two free ends, said corrugation adapting each sidewall to fold upon itself when a force is applied to an area of said member to provide a flattened portion on said member, the flattened



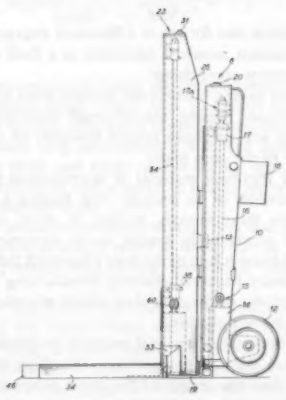
portion being adapted to be secure by fastening means to a component of said ladder frame, the width of the flattened portion being substantially the same as the nominal width of said member.

4,049,083

ELECTRICALLY POWERED HAND TRUCK WITH STACKER ATTACHMENT

Eugene N. Garvey, Appleton, Wis., assignor to Woodward Mfg. & Sales Co., Inc., Appleton, Wis.

Filed Nov. 23, 1976, Ser. No. 744,425
Int. Cl.[2] B66B 9/20
U.S. Cl. 187—9 R 12 Claims



1. A stacker attachment for releasably mounting to a two wheel, battery powered hand truck which has a movable elongated inner frame, an elongated stationary outer frame, said inner frame movable only below the wheels at the bottom of said stationary frame, said stacker attachment including

an elongated outer stationary frame having spaced sides and a connecting top, a stabilizing member extending at a right angle from the bottom of the spaced sides for making ground contact, mounting means on said stationary frame for releasably mounting the stacker to a two wheel hand truck,

a movable inner frame having spaced sides and a connecting top member, said inner movable frame having a height substantially less that the height of the stationary frame, a lifting member mounted at a right angle to the bottom of said movable frame,

an electric motor at the bottom of the stacker, means mounting said motor to the sides of the stationary frame,

mechanical means to raise and lower said movable inner frame, said mechanical means interconnected between said electric motor, said stationary frame, and said movable frame,

conductors extending from said electric motor with battery lead portions for connection to a battery, and

switch means to selectively operate said mechanical means to raise the movable frame, and mounted lifting member, above the bottom of the stationary frame, and to lower the movable frame, and mounted lifting member, to the bottom of said stationary frame.

4,049,084

AUDIBLE LINING WEAR INDICATOR

Richard B. Beemer, Lombard, and Richard G. Hennessey, Oak Lawn, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Nov. 28, 1975, Ser. No. 635,817
Int. Cl.² F16D *66/02*
U.S. Cl. 188—1 A **2 Claims**

1. In a friction disc for use in a frictional engagement device including reaction members operating in a fluid environment the improvement comprising:

a core plate having obverse and reverse faces and a plurality of apertures passing therethrough including a central aperture and apertures spaced inwardly of the outer periphery of the core plate;

a primary frictional material of microporous material in a configuration of an annular ring having a plurality of apertures therethrough, having its static coefficient of friction substantially similar to its dynamic coefficient, bonded to each face of the core plate with the apertures of the primary frictional material annular ring aligned with the apertures of the core plate which are spaced inwardly of said outer periphery;

slugs of secondary frictional material occupying the outer periphery core plate apertures, the slugs being slightly longer than the length of the outer periphery core plate apertures and freely slidable therein where the slugs are of such material as to produce an audible signal upon contact with cooperating reaction members to indicate wear of the primary frictional material.

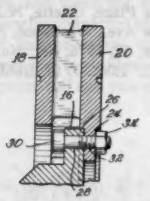
4,049,085

CALIPER BRAKE WITH ASSEMBLY FOR ROTOR ATTACHMENT TO HUB

Donald E. Blunier, Niles, Mich., assignor to Safety Racing Equipment, Incorporated, Eau Claire, Mich.

Filed Aug. 10, 1976, Ser. No. 713,110
Int. Cl.² F16D *65/12*
U.S. Cl. 188—18 A **6 Claims**

1. In a caliper brake comprising a hub and a rotor, the combination of a hub having an annular rotor-attaching flange and a rotor having apposed annular chamfers complementary to said annular flange and means for attaching said rotor to said flange with the said flange in one of said chamfers, said chamfers being off center so that when the rotor seated in one chamfer



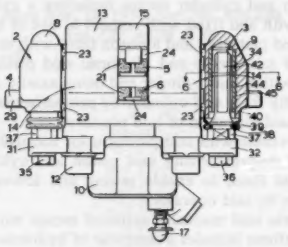
it is closer to the hub than when it is seated in the other chamfer.

4,049,086

VEHICLE DISC BRAKES

Heinrich Bernhard Rath, Vallendar, Rhine, Germany, assignor to Girling Limited, Birmingham, England

Filed Aug. 12, 1976, Ser. No. 713,815
Claims priority, application United Kingdom, Aug. 30, 1975, 35855/75
Int. Cl.² F16D *65/02*
U.S. Cl. 188—73.3 **14 Claims**



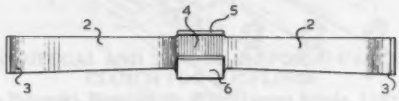
1. An hydraulically operated disc brake for a vehicle, comprising a rotatable disc, a stationary drag-taking part located against one face of said disc, a caliper straddling a portion of the peripheral edge of said disc, first and second circumferentially spaced guide means carried on said drag-taking part and adapted to guide said caliper for sliding movement in a direction generally parallel to the axis of said disc, friction pad assemblies for engagement with opposite faces of said disc located in said caliper, and actuating means for applying one of said friction pad assemblis directly to said disc and for causing said caliper to slide relative to said drag-taking part to apply the other of said friction pad assemblies indirectly to the opposite face of said disc, each of said guide means comprising guide member, said guide member being provided with a circular bore, a peg member working in said bore, one of said members being secured to said drag-taking part and the other to said caliper, a resilient moulded bush having an inner elongate bore being located in one of said bores, only the first of said peg members sliding in an elongate bore with some free play along a line extending perpendicularly between the axes of said two peg members, said first peg member being a substantially tight fit in said bush in a direction perpendicular to said line.

4,049,087

FRICTION PAD ASSEMBLIES FOR SLIDING CALIPER DISC BRAKES

Kurt Erich Heinz, Neuwied, and Horst Willi Klassen, St. Sebastian, both of Germany, assignors to Girling Limited, Birmingham, England

Filed Dec. 23, 1975, Ser. No. 643,826
Claims priority, application United Kingdom, Dec. 24, 1974, 55726/74
Int. Cl.[2] F16D *65/00*
U.S. Cl. 188—73.5 3 Claims



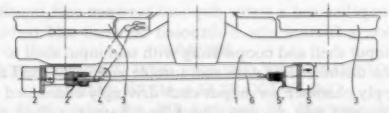
1. A combination of friction pad assembly and a sliding caliper disc brake, the brake comprising a torque member and a caliper member, the caliper member being attached to the torque member for sliding movement relative thereto and arranged to act on the friction pad assembly which is located in a recess in the torque member, the friction pad assembly comprising a backing plate, a pad of friction material secured to the backing plate and a leaf spring securely attached to the backing plate prior to installation of the assembly in the disc brake, the leaf spring comprising a central clip portion and two oppositely directed arms, the arms being integrally formed with the central clip portion and extending substantially parallel to the plane of the backing plate, the flat surfaces of the arms being substantially normal to the plane of the backing plate, the central clip portion having, in transverse cross-section, a generally inverted u-shape comprising a substantially planar base section from each side of which depends a leg, one leg being substantially normal to the base section and the other leg being angled towards said one leg, the legs engaging one on either side of a tab which is free of friction material and projects from an edge of the backing plate, said other leg engaging into a recess in the tab, the two arms of the spring engaging the caliper member whereby the friction pad assembly is held in the recess in the torque member and the caliper member and torque member are biased apart, the pad assembly and brake being so designed that the spring at all times is outside the area which, when the brake is in use, is swept by the disc.

4,049,088

PARKING BRAKE ARRANGEMENT FOR A RAIL VEHICLE BRAKE

Anders Olov Gunnar Stjarne, and Nils Borje Lennart Sander, both of Malmo, Sweden, assignors to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Filed Feb. 24, 1976, Ser. No. 660,856
Claims priority, application Sweden, Feb. 27, 1975, 7502201
Int. Cl.[2] F16D *65/30*
U.S. Cl. 188—107 1 Claim



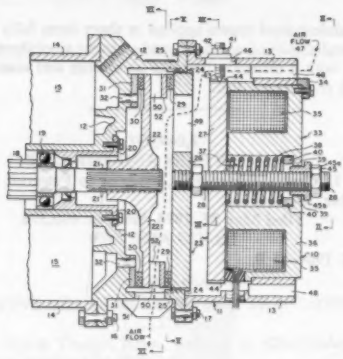
1. A parking brake arrangement for a rail vehicle brake, comprising in combination, a service brake actuator with a piston and built-in slack adjuster for providing a braking force along an actuator force transmission path to braking levers in said vehicle, a separate spring brake cylinder unit remotely located from said actuator with the spring brake spring acting in the brake application direction of said actuator, and a fluid pressure responsive piston keeping the spring compressed in the presence of fluid pressure, a force transmitting pull rod linkage coupling the spring brake cylinder between the service brake piston and the slack adjuster, and a disengagement mechanism built into said spring brake unit with an externally extending control lever for permitting a retuurn movement of the actuator and linkage in the absence of fluid pressure in said spring brake piston.

4,049,089

ELECTROMAGNETIC BRAKE ASSEMBLY

Frederick Stanley Rundle, Montour Falls, N.Y., assignor to Shepard Niles Crane & Hoist Corporation, Montour Falls, N.Y.

Filed July 6, 1976, Ser. No. 702,420
Int. Cl.[2] B60T *13/04*
U.S. Cl. 188—171 17 Claims



1. An electromagnetic brake assembly comprising:

A. A rotatable brake wheel fixed to a shaft which has the rotation thereof selectively braked by the brake assembly;

B. a pressure ring nonrotatably mounted axially a given distance from said brake wheel during operational rotation of said shaft and adapted to axially move toward and away from the brake wheel;

C. a brake armature mounted axially from said pressure ring and adapted to axially move in fixed relation with respect to said pressure ring during operational rotation of said shaft;

D. at least one brake liner adapted to fricationally engage between the brake wheel and pressure ring when the pressure ring is moved axially toward the brake wheel;

E. an electromagnetic means mounted axially from the brake armature for engaging the brake armature to move the pressure ring away from the brake wheel;

F. biasing means for urging the brake armature and pressure ring toward the brake wheel to engage the brake liner between the brake wheel and pressure ring and brake the rotation of the brake wheel; and

G. gap control means for adjusting the axial distance between the brake wheel and the pressure ring.

4,049,090

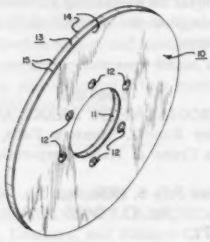
BRAKE DISCS

Erik F. Buell, Box 418, R.D. No. 2, Gibsonia, Pa. 15044

Continuation-in-part of Ser. No. 611,621, Sept. 9, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,608
Int. Cl.[2] F16D *69/02*
U.S. Cl. 188—251 M 5 Claims

1. In a vehicle disc brake assembly including a brake disc and a pair of brake pads engaging opposite sides of said disc over an area less than the circumferential disc surface the improvement comprising a brake disc providing a reduction in unsprung

weight and improved thermal dissipation consisting essentially of a circular core from the group consisting of high strength and hardenable aluminum alloys forming the major thickness component and having substantially parallel spaced sides clad



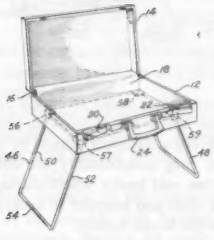
with stainless steel sheets applied in sheet form fully covering each parallel side of said core, said stainless steel sheets bonded thereto with a diffusion bond of aluminum and stainless steel forming an integral disc.

4,049,091

ATTACHE CASE AND THE LIKE

Wayne L. Chubb, Porter, Ind., assignor to Faircraft Engineering, Inc., Porter, Ind.

Filed May 27, 1976, Ser. No. 690,374
Int. Cl.[2] A45C *5/04*
U.S. Cl. 190—18 R **5 Claims**



1. An attache case and the like, comprising a lower section having a side panel, an upper section hinged to said lower section, means on said side panel forming a recess, legs foldable into said recess, a reversible top insertable in said recess, and means secured to said top pivotally holding said legs near each end of said recess and pivoting said legs outwardly for supporting the case, said top being substantially the same size and shape as said recess for enclosing said legs in said recess when the legs are in folded position and when the top is disposed in the recess with the legs between the bottom of the recess and the top.

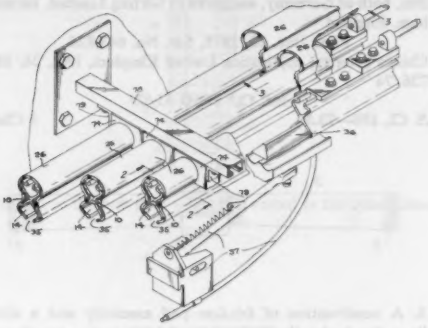
4,049,092

CURRENT CONDUCTOR SYSTEM

Richard E. Lillard, and William M. Cope, both of Lynchburg, Va., assignors to H. K. Porter Company, Inc., Lynchburg, Va.

Filed Sept. 15, 1976, Ser. No. 723,240
Int. Cl.[2] B60M *1/20*
U.S. Cl. 191—40 **13 Claims**

12. In a current conducting system of the character described, a current conductor bar of a uniform transverse cross-section throughout its length having a bottom guide channel for a current collector in slidable contact with the underside of said bar and a pair of branches respectively extending upwardly and outwardly in divergent relation to provide the top of said bar with a longitudinally extending cavity of substantially V-shape in transverse section, the outer ends of said divergent branches being respectively provided with inturned coplanar flanges which respectively terminate in substantially parallel upstanding lips spaced equidistantly from the vertical



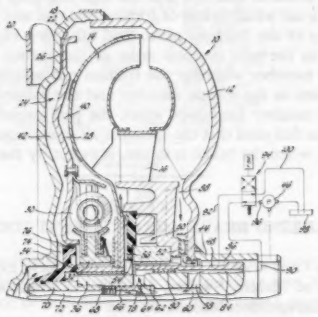
median plane of the conductor bar, thereby providing the topside cavity of said conductor bar with a top wall part having a longitudinally extending slot centered midway between the opposite sides of the bar.

4,049,093

TORQUE CONVERTER AND LOCK-UP CLUTCH WITH A FLOW DIVIDER VALVE

William J. Vukovich, Pittsfield Township, and Paul D. Stevenson, Ann Arbor, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 19, 1976, Ser. No. 706,396
Int. Cl.[2] F16H *45/02*
U.S. Cl. 192—3.3 **2 Claims**



1. A torque converter and lock-up clutch having a flow divider control valve comprising; a torque converter having an input shell adapted to be rotated by a prime mover, an impeller secured to said input shell, a turbine in fluid flow relation with said impeller and a stator disposed between said impeller and turbine; a friction clutch disposed between said turbine and said input shell and cooperating with said input shell to form a release chamber and with said turbine and input shell to form an apply chamber; an output shaft drivingly connected to said turbine and said friction clutch and having a fluid passage formed therein; first fluid path means for communicating fluid between said stator and said impeller to engage said clutch; second fluid flow path means for communicating fluid to said passage to release said clutch; and pressure differential responsive valve means disposed in said passage for dividing fluid flow between said release chamber and said torque converter wherein the fluid flow is introduced between said stator and said turbine when fluid flow is toward said release chamber

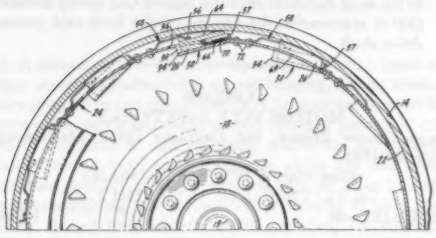
and for permitting fluid flow from said release chamber when fluid is exhausted therefrom, said valve means including a restriction means for permitting a predetermined flow to said release chamber when the fluid flow is toward said release chamber before said valve means directs fluid flow to said torque converter between said stator and said turbine; and means for controlling fluid flow to and from said first and second fluid flow path means.

4,049,094

CENTRIFUGAL AND TORQUE RESPONSIVE LOCK UP CLUTCH FOR COUPLINGS

John Polomski, Birmingham; Willis Lorenz Schulz, Utica, and Victor Joseph Specht, Fowlerville, all of Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 7, 1975, Ser. No. 620,461
Int. Cl.[2] F16H *45/02*
U.S. Cl. 192—3.31 **9 Claims**



1. An engaging mechanism comprising, first and second relatively rotating members, an annular sheet metal support having a periphery and fixed to said first member, a plurality of friction shoes mounted between said support and said second member, cam means on said support in engagement with said shoes, said shoes having a frictional surface thereon, said cam means being formed of the material of said support and extending radially inwardly from said periphery, centrifugal force acting to urge said devices to move into engagement with said second member at a given speed of rotation to lock said members for rotation together, said cam means comprising a series of ramps distributed around the periphery of said support, said cam means acting after initial engagement to wedge said shoes between said support and said second member over the entire arcuate length of said shoes, the torque capacity of said mechanism being so designed that said engagement will release during torque surges and torque reversals through said mechanism to momentarily allow relative rotation between said members.

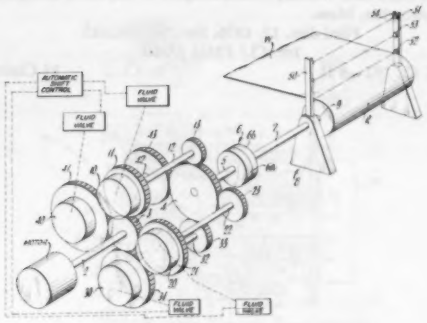
4,049,095

MULTIPLE SPEED WEB REWIND TRANSMISSION IN SERIES WITH A SLIP COUPLING

Edwin J. Montalvo, Sr., 283 Anderson St., Hackensack, N.J. 07602

Filed May 15, 1975, Ser. No. 577,949
Int. Cl.[2] F16D *67/00*
U.S. Cl. 192—3.51 **8 Claims**

2. In combination, a motor, a plurality of non-slip clutches and a slip clutch which slips constantly during driving, means for driving input elements of said non-slip clutches at mutually different ratios with respect to the output speed of said motor, means for successively engaging said non-slip clutches one at a time, each of said non-slip clutches having an output shaft



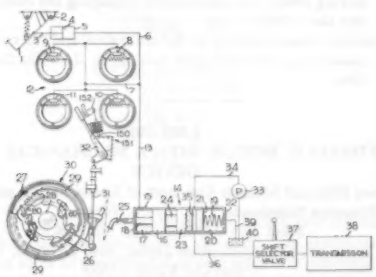
mounted in driving relationship with an input side of said slip clutch.

4,049,096

PARKING BRAKE RELEASE FOR TRANSMISSION CLUTCH

John W. Barth, Topeka, Kans., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Division of Ser. No. 534,566, Dec. 19, 1974, Pat. No. 3,957,143.
This application Dec. 22, 1975, Ser. No. 643,320
Int. Cl.[2] B60K *41/26*
U.S. Cl. 192—4 A **5 Claims**



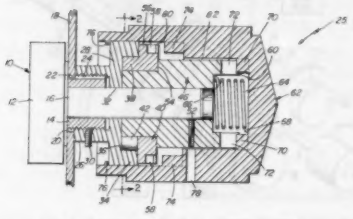
1. A vehicle control system comprising, a source of pressurized fluid, a hydraulically actuated vehicle transmission, a transmission shift selector valve for selectively engaging said transmission, a mechanically operated vehicle parking friction brake, brake operating means including, a brake lever, a brake actuating means operatively connected between said brake lever and said vehicle parking brake for actuating said vehicle parking brake, a cutoff valve connected through said shift selector valve between said source of pressurized fluid and said transmission, a cable connected between said brake operating means and said transmission cutoff valve for operating said cutoff valve to interrupt communication between said source of pressurized fluid and said transmission for rendering said transmission inoperative when said vehicle parking brake is actuated.

4,049,097

KNOB WITH LOCK RELEASE MEANS

Albert R. Pratt, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 12, 1976, Ser. No. 648,613
Int. Cl.[2] F16D *67/00*
U.S. Cl. 192—8 R **11 Claims**



1. A knob assembly for mounting on a rotatable shaft and comprising:

a fixed race having a cylindrical cavity therein and having an outer peripheral wall;

a rotatable cylinder having a cam-shaped end portion axially disposed in the cavity of the race and having an adjacent radial shoulder, the cam-shaped end portion including a plurality of angularly spaced projections disposed in predetermined spaced relationship with the wall of the race;

locking means disposed between the projections of the cam-shaped end portion in the cavity of the race for releaseably engaging the cam-shaped end portion of the cylinder;

a rotatable release disc encircling the cam-shaped end portion of the cylinder and having angularly spaced portions disposed between respective projections of the cam-shaped end portion and the wall of the race, the disc also having an end surface disposed in abutting engagement with the radial shoulder and having overlying the wall of the race a flange provided with a plurality of angularly spaced release slots;

an enclosing knob shell rotatable about the fixed race and having means for controllably engaging the release means and the cylinder; and

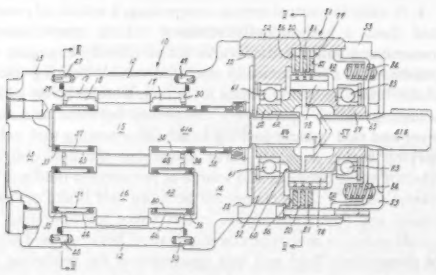
resilient means coupled to the knob shell and the cylinder for positioning the shell with respect to the cylinder and the disc.

4,049,098

HYDRAULIC MOTOR WITH A MECHANICAL BRAKE DEVICE

Yasuo Kita, and Makoto Kou, both of Kyoto, Japan, assignors to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed July 26, 1976, Ser. No. 708,550
Claims priority, application Japan, Aug. 23, 1975, 50-102498
Int. Cl.[2] F16D *67/00*
U.S. Cl. 192—8 R **6 Claims**



1. In a hydraulic motor having a primary drive shaft (**41*a***), a brake device capable of being removed in response to the driving torque from said primary drive shaft, the brake device comprising:

a. a secondary drive shaft (**41*b***) aligned on the same axis with said primary drive shaft;

b. a shaft coupling assembly (**60**) for connecting said secondary drive shaft to said primary drive shaft, said coupling assembly including a pair of coupling element members (**58, 59**) one of which is fixed to the either of said two drive shafts and other of which is slidably mounted in the axial direction with the other of said two drive shafts;

c. a brake means (**79**) held on said slidable coupling element member, said brake means including the plurality of circular brake shoes (**81**) and circular brake plate members (**80**);

d. a cylindrical brake operating member (**82**) with a bearing (**83**) mounted on said slidable coupling element member and slidable therewith;

e. a case (**52**) for holding said brake device, a plurality of spring members (**84**) for pressing said brake means (**79**) against the case (**52**) of said brake device through said brake operating member (**82**); and,

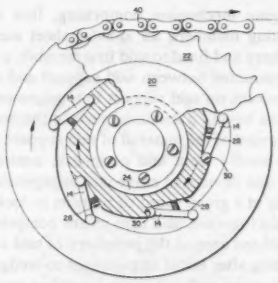
f. a cam means for sliding said slidable coupling element member together with said brake operating member (**82**) in the axial direction resisting against said spring members (**84**) in response to the driving torque from said primary drive shaft.

4,049,099

MOTORCYCLE SAFETY HUB

Joseph Spence Zeigler, 166 Cullinane Drive, Marlborough, Mass. 01752

Filed Mar. 3, 1976, Ser. No. 663,261
Int. Cl.[2] F16D *11/00, 13/04;* F16H *57/00*
U.S. Cl. 192—46 **1 Claim**



1. In a motorcycle safety mechanism for automatically changing from a primary operative mode to a secondary failure mode upon any malfunction leading to a stoppage in the drive train, the combination of:

a rotatable driven plate mounted integrally with the rear wheel brake drum hub assembly of the motorcycle,

a friction disc supported by the driven plate,

a plurality of spring-loaded driving dogs each pivotally mounted on a boss of the rear wheel axle of the motorcycle,

a rotatable driving plate mounting the rear wheel driving sprocket and mounted rotatably relative to the driven plate,

an annular clutch plate mounted on the driving plate and having a plurality of circularly-arranged equispaced ramps inwardly inclined in the direction of normal rotation and each terminating in a dog receiving stop,

adapted and arranged while the mechanism is in primary operative mode for the preclusion of relative rotation of the driven and driving plates with the dogs each in confrontation with a respective stop and while in a state of

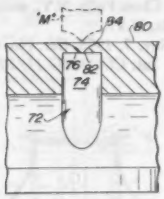
seizure in a secondary failure mode for the dogs to be withdrawn from the respective stops under the influence of the reversed input torque and led across the stops allowing free wheeling between the plates.

4,049,100

TORQUE CONTROL DEVICES OF THE VISCOUS SHEAR TYPE AND COMPONENTS THEREFOR

William P. Davis, Exton, Pa., assignor to L G Industries, Incorporated, Coatesville, Pa.

Filed Dec. 15, 1975, Ser. No. 640,454
Int. Cl.² F16D *13/72*
U.S. Cl. 192—58 C **11 Claims**



1. A torque control device comprising a housing, input and output members journalled in to said housing, spaced pressure plates coupled to one of said members for rotation therewith, a clutch plate interposed between said pressure plates and coupled to the other of said members, and means for applying axially directed force to said pressure plates and said clutch plate, said pressure plates comprising annular disks having a torque-transmitting face thereon and a plurality of circumferentially spaced fluid transfer ports extending therethrough, said ports comprising a blind slot portion opening upon the other face of said disk and extending toward said torque transmitting face, and an indentation in said torque transmitting face extending from said torque transmitting face and intersecting said blind slot, said indentation being elongated in a direction parallel to the major axis of said blind slot portion so that the intersection of said blind spot and said intersection defines an opening having a width and length less than the width and length of said blind slot portion, said indentation providing a bevel between said torque transmitting face and said opening, and resilient lining means on said clutch plate juxtaposed to said fluid transfer ports.

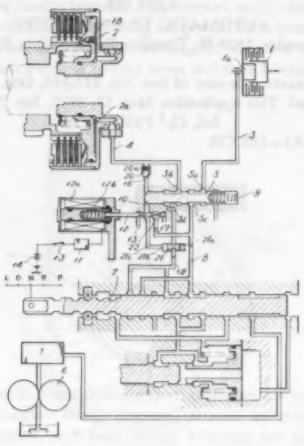
4,049,101

APPARATUS FOR PREVENTING FAULTY OPERATION IN TRANSMISSION OF MOTORCARS

Torao Hattori, Wako, and Masakazu Maezono, Niiza, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1976, Ser. No. 673,890
Claims priority, application Japan, Apr. 8, 1975, 50-41777
Int. Cl.² F16D *25/10*
U.S. Cl. 192—87.19 **3 Claims**

1. An apparatus for preventing faulty operation in automatic transmission of motor cars, said transmission having a speed-change sensor and a shift valve therein, for controlling the operation of the latter, the apparatus comprising an oil-pressure operated high-speed clutch interposed in a high-speed system, and an oil-pressure operated low-speed clutch interposed in a low-speed system of said transmission, and means for interchangeably connecting said systems through said shift valve to a main line circuit that is connected to an oil-pressure source, wherein said shift valve is operable by the oil pressure, and has at one end an oil-pressure chamber connectable to said main circuit through a pilot valve that can be opened by operation of said sensor, and wherein said chamber is connected to said low-speed clutch through a by-pass, and a flow passage that connects said chamber to said main circuit has a restrictor interposed therein, while said low-speed clutch is provided with a leak valve that is opened when said low-speed clutch is



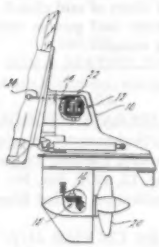
operated at a speed higher than a predetermined value, for discharging the oil pressure from said low-speed clutch.

4,049,102

CLUTCH SHIFTING MECHANISM

John W. Hurst, Port Huron, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed July 19, 1976, Ser. No. 706,365
Int. Cl.² F16D *21/04, 23/12*
U.S. Cl. 192—93 R **10 Claims**



1. In a reversing clutch mechanism wherein two rotatable members are disposed spacedly on a shaft and are axially movable on the shaft to positions of engagement and non-engagement with the clutch mechanism, means coupling the two members together for joint axial movement on the shaft and including

a cam,

means mounting the cam for bidirectional rotation in a plane spaced from the shaft and substantially parallel thereto,

means for selectively rotating the cam in either rotary direction,

a cam follower positioned between the shaft and the cam and including a portion which extends toward the cam and is located eccentrically relative to the center of rotation of the cam,

means mounting the cam follower for reciprocating linear movement in a plane substantially parallel to the shaft,

means connecting the cam follower portion eccentrically to the cam whereby partial rotation of the cam in either rotary direction causes the cam follower to move parallel to the shaft in a corresponding linear direction, and

means connecting the two members to the cam follower.

4,049,103

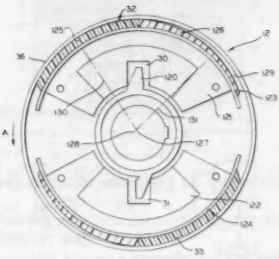
AUTOMATIC TRANSMISSION

John A. Sessler, 1600 W. Townline Road, Milton Junction, Wis. 53564

Continuation-in-part of Ser. No. 511,443, Oct. 2, 1974, abandoned. This application May 17, 1976, Ser. No. 686,915

Int. Cl.² F16D *43/14*

U.S. Cl. 192—105 CD **8 Claims**



1. An automatic power train comprising a power input means and a power output means with an automatic transmission means in between;

dry clutch means interposed in said power train to prevent sudden applications or over-running of a load;

said clutch means comprising at least one shoe and drum;

means responsive to centrifugal force for causing said at least one shoe to engage said drum only when said power input means is up to driving speed with respect to said power output means; and

means for varying coefficients of friction between portions of said drum and shoes of said clutch to promote slippage between each when said power output means overruns said power input means.

4,049,104

POWER OPERATED TORQUE TOOL

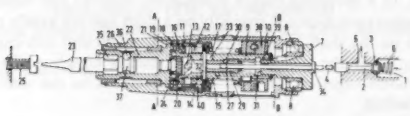
George Henry Webb, Berkhamsted, England, assignor to Desoutter Brothers Limited, London, England

Filed Apr. 13, 1976, Ser. No. 676,402

Claims priority, application United Kingdom, Apr. 30, 1975, 17945/75

Int. Cl.² F16D *43/20*

U.S. Cl. 192—150 **6 Claims**



1. A pressure-fluid operated torque tool having

a pressure-fluid driven motor,

a valve controlling the flow of pressure fluid to the motor,

a torque-responsive clutch having a clutch member adapted to move axially when the torque delivered exceeds a predetermined level,

a tubular member carrying the drive from the motor to the clutch, and having an internally-tapered portion,

a push-rod extending centrally through the tubular member,

a plurality of rod-engaging balls arranged between the tapered portion of the tubular member and the rod, to be forced against the rod by the tapered portion to grip the rod, and

a cage for supporting the balls, which cage is moved axially by said axially movable clutch member, when the predetermined torque level is reached, to release the grip of the balls on the rod; and below the predetermined torque is biassed by a spring to bring the balls into cooperation with the tapered portion, where they grip the rod.

4,049,105

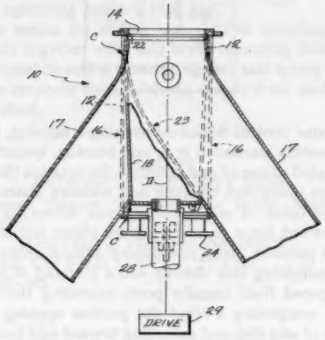
DIVERTER VALVE

Peter G. Kindersley, Glens Falls, N.Y., assignor to Kamyr Incorporated, Glen Falls, N.Y.

Filed Nov. 7, 1975, Ser. No. 629,902

Int. Cl.² B65G *11/20*

U.S. Cl. 193—31 R **8 Claims**



1. A gravity-feed flowable material diverter valve assembly comprising

a. a valve housing having an inlet, a tubular substantially constant diameter main body portion symmetrical about a generally vertical axis, and a plurality of outlets, said inlet being located vertically above said outlets,

b. means for diverting flowable material flowing through said inlet to a selected one of said plurality of outlets while preventing delivery of flowable material to the other of said outlets, said means comprising

i. an inner element in the shape of a truncated cone, said inner element concentric with and located in said housing and symmetrical about said generally vertical axis and spaced from said housing main body portion a distance that increases from said inlet toward said outlets, and extending generally the whole length of said housing, and mounted for non-eccentric rotation about said generally vertical axis,

ii. a hollow diverter element mounted within and rigidly connected to said inner element and having a first end defining an open top thereof in communication with said housing inlet, and having a second end defining a side opening located about 90° from said open top end for communication with a selected one of said plurality of outlets, said inner element having top and side openings therein corresponding to said top and side openings of said diverter element,

iii. a plurality of outlet arm members, one corresponding to each of said housing outlets, each of said arm members having a portion thereof extending through said housing and making sealing contact with the outer surface of said inner element, and

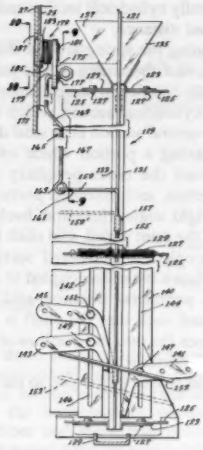
c. means for rotating said inner element with respect to said housing about said generally vertical axis of rotation.

4,049,106

VENDING MACHINE MECHANISM HOUSING AND ARMOR PROTECTION THEREFOR

Jack S. Chalabian, Huntington Beach, Calif., assignor to K-Jack Engineering Company, Inc., Gardena, Calif.

Continuation-in-part of Ser. No. 664,546, March 8, 1976, abandoned. This application May 19, 1976, Ser. No. 687,881
Int. Cl.[2] G07F 5/08
U.S. Cl. 194—1 B 24 Claims



1. A coin mechanism housing comprising a body having
means for mounting said body to a vending machine,
means for receiving coins of various combinations inserted by a consumer for delivery to a coin selection and control mechanism,
means for storing coins of predetermined value passed through a coin selection and control mechanism in said body,
means for returning coins of other than predetermined value and which have been rejected by a coin selection and control mechanism to a consumer who has inserted them into said receiving means,
means for delivering the coins inserted into said receiving means to one of said storing means and said returning means,
baffle means through which coins must pass, intermediate said delivery means and said storing means,
a key-operated locking mechanism on said body which is operable to alter the operating mode of a coin selection and control mechanism within said body, and
indicia placed on the exterior of said body with the position of the indicia relative to the locking mechanism indicating the operating mode of the coin selection and control mechanism.

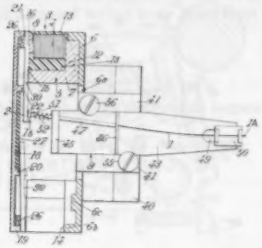
4,049,107

PRINTING DEVICES OR HEADS FOR PRINTERS OR THE LIKE AND A PROCESS FOR MAKING SUCH A PRINTING HEAD

Roger Murat, Argenteuil, France, assignor to Societe d'Applications Generales d'Electricite et de Mecanique SAGEM, Paris, France

Filed Oct. 3, 1975, Ser. No. 619,321
Claims priority, application France, Oct. 8, 1974, 74.33837
Int. Cl.[2] B41J 3/04
U.S. Cl. 197—1 R 8 Claims

1. In a printing device for a printer having an assembly of needles and respective control means for each of said needles one end of each needle being intended to strike an information and support and mark thereon selected points representative of figures, characters or the like, said control means comprising a metal plate and an electro-magnet for displacing said plate when a signal is applied across the winding of the electro-magnet, the displacement being such as to cause the projection of the respective needle towards said support, each electro-magnet of said control means being supported in a base, the improvement wherein each electro-magnet includes a substantially U-shaped element having arms defining a magnetic circuit, said element being separate from said base, the winding of said electro-magnet being disposed around an arm of said U-shaped element, said base having housings for supporting said magnetic circuit elements, and a surrounding material is provided to adhere to said magnetic circuit element and said base, said surrounding material encapuslating each winding and said arm supporting said winding to fix said elements and windings with respect to said base and protect said windings.

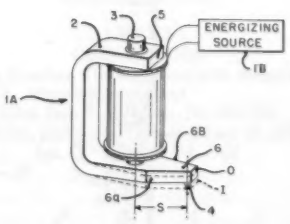


4,049,108

ACTUATOR FOR A MATRIX PRINT HEAD

Frank Giessner, Augsburg, Germany, assignor to NCR Corporation, Dayton, Ohio

Filed July 29, 1976, Ser. No. 709,739
Claims priority, application Germany, Dec. 23, 1975, 2558380
Int. Cl.[2] B41J 3/04
U.S. Cl. 197—1 R 5 Claims



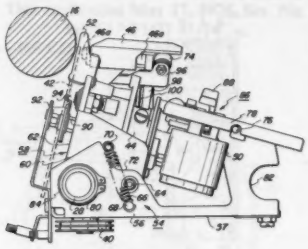
1. An actuator comprising:
a magnet means having first and second ends; and
a spring means having one end fixed to said first end of said magnet means and also having a free end located near said second end and having an actuating element on said free end;
said spring means being shaped to provide a magnetic flux path for said magnet means; and
said spring means being generally U-shaped and formed from a single piece of magnetic material, and said magnet means being an electromagnet means.

4,049,109

PRINT MEMBER CARRIAGE ASSEMBLY

Mario G. Plaza, Fremont, and Richard D. Trezise, Newark, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 8, 1976, Ser. No. 664,789
Int. Cl.² B41J *1/24*
U.S. Cl. 197—53 **8 Claims**



1. A carriage assembly for transporting a print member along a predetermined path adjacent a support member, comprising:

a first carriage section adapted to be mounted adjacent said support member for movement along said predetermined path;

means for mounting a print member to said first carriage section for movement between first and second positions relative to said support member; and

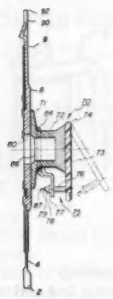
means, coupled to said means for mounting, for retaining a print member mounted to said first carriage section in each of said first and second positions, said means for retaining including a dual biasing spring for biasing said print member in a direction opposite said second position when at said first position and for biasing said print member in a direction opposite said first position when at said second position.

4,049,110

PRINT WHEEL MOUNTING ASSEMBLY

Kenneth R. Frechette, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed May 28, 1976, Ser. No. 691,264
Int. Cl.² B41J *1/30*
U.S. Cl. 197—53 **4 Claims**



1. In a daisy wheel print element having a plurality of spokes extending radially outward from a central section, character slugs having a print surface and an impact surface and coupled to the ends of the spokes, said central section having an opening centered therein for mounting the print element on a shaft of a print wheel motor; an improved print element mounting assembly comprising:

a generally circular disc section having a central opening and being coupled to the central sectin and positioned coaxially with the opening in the central section,

a generally cylindrical section having a central opening and being coupled at one end to the generally circular disc section and positioned coaxially with the opening in the central section,

a coil spring having at least one turn positioned around the periphery of the generally cylindrical section, and coil spring having two end portions which extend radially from the generally cylindrical section and are spaced apart a predetermined distance,

means for tightening the spring around the generally cylindrical section, said tightening means having an end cap section pivotally coupled to one edge portion of the end of the generally cylindrical section which is positioned furthest from the central section in an axial direction, said end cap section having a portion which extends in a radial direction beyond the outer periphery of the generally cylindrical section, said extended portion having a shaft extending at right angles therefrom back toward the central section of the print wheel, said shaft having a cylindrical section coupled to a tapered section increasing in peripheral distance which is coupled to a tapered section decreasing in peripheral distance, said end cap section being positioned such that the shaft is capable of being inserted between the two end portions of the coil spring to spread the end portions apart,

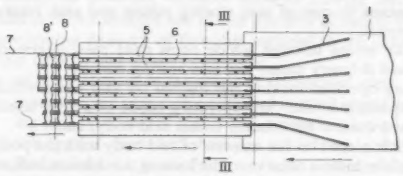
whereby the print wheel is clamped to the shaft of the print wheel motor.

4,049,111

DEVICE FOR CONVEYING EGGS

Jacob Hendrik Mosterd, Barneveld, Netherlands, assignor to Moba Holding Barneveld B.V., Barneveld, Netherlands

Filed July 23, 1975, Ser. No. 598,422
Claims priority, application Netherlands, Aug. 8, 1974, 7410666
Int. Cl.² B65G *47/26*
U.S. Cl. 198—445 **9 Claims**



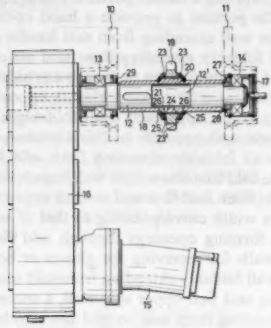
1. A device for conveying eggs, comprising a broad conveyor on which a number of eggs can be randomly positioned, a discharge device having a number of juxtapositioned discharge locations, and a number of generally horizontal mutually parallel gutters located between the broad conveyor and the discharge device, each gutter having slightly tilting sidewalls and a slot in the central portion between the sidewalls, push members protruding only slightly through said slots, and means for moving said push members longitudinally through said slots relative to the gutter sidewalls in the direction from the broad conveyor towards the discharge device, said push members comprising freely rotatable circular members for passing beneath an obstructed egg in said gutters without injuring the egg, but pushing unobstructed eggs along said gutters, whereby obstructed eggs caused by irregular feed to or discharge from said gutters may be temporarily stowed along any of said gutters without breakage.

4,049,112

CHAIN DRUM FOR CHAIN CONVEYORS

Willy Tyslauk, Lunen, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Westphalia, Germany

Filed Dec. 16, 1975, Ser. No. 641,326
Claims priority, application Germany, Dec. 19, 1974, 2460099
Int. Cl.[2] B65G 23/06
U.S. Cl. 198—834 6 Claims



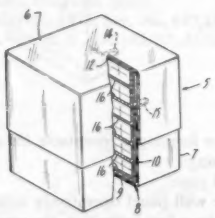
1. In a chain drum for a chain conveyor, in particular a scraper-chain conveyor mounted on a cutting jib of a cutter-loader or the like, having a shaft supported at axially spaced apart locations, the improvement comprising a one-piece sleeve separate from said shaft, said sleeve surrounding said shaft and being disposed between said axially spaced locations, means constraining the sleeve to rotate with the shaft, the sleeve being provided with external teeth, at least one diametrally split sprocket surrounding said sleeve, said at least one sprocket comprising two sprocket halves having axial shoulders, removable locking means overlapping said shoulder portions to hold said sprocket halves on said sleeve, and circlips holding the locking means in place against axial movement, the sprocket halves being provided with internal teeth which interengage with the teeth on the sleeve and constitute therewith a force-transmitting connection between the sleeve and the split sprocket, whereby said sprocket halves may be removed from said sleeve without disassembly from said shaft.

4,049,113

MERCHANDISE CONTAINER

James E. Joyce, 878 Darien, Rochester, Mich. 48063, and Judy A. Zeller, 5559 Westwood Lane, Birmingham, Mich. 48010

Filed Oct. 26, 1976, Ser. No. 735,910
Int. Cl.[2] B65D 5/50, 5/52
U.S. Cl. 206—44 R 28 Claims



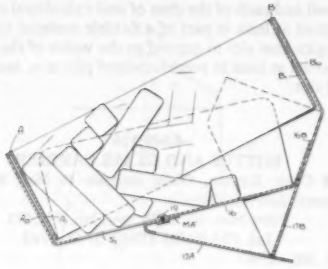
1. A merchandise container comprising: an outer carton; a plurality of merchandise trays disposed in stacked relationship within said carton; and at least one wrapper of sheet material, each having a bottom and opposed side portions terminating in integrally hinged flaps, each wrapper being disposed around a portion of said stacked trays, the side portions of each wrapper being of such height as to enclose said portion of stacked trays disposed within and permitting said flaps to fold over the top of said portion of stacked trays, the cumulative height of said side portions of said wrappers substantially filling said carton, wherein some of said wrappers have registering apertures formed in their flaps and side portions and the other said wrappers have pairs of registering apertures formed in their flaps which straddle a fold line which divides each flap, said apertures to act as a double-walled reinforced handle to permit the wrapper and trays disposed within to be lifted from the carton.

4,049,114

CONVERTIBLE CARTON

Hans Danheisser, Merrick, N.Y., assignor to Immco Industries, Inc., Flushing, N.Y.

Filed July 26, 1976, Ser. No. 708,686
Int. Cl.[2] B65D 5/52, 25/24
U.S. Cl. 206—44 B 11 Claims



1. A convertible carton which is capable in a storage mode of containing a multiplicity of like items in an orderly array and when converted to assume an open-bin form in a jumble mode to display these items in disarray, the carton comprising:

A. a rectangular shell having front, rear and side walls; and

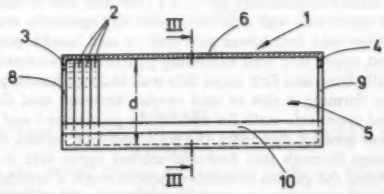
B. a drop-out base secured to said shell, said base in the storage mode being flat to provide a carton of uniform depth and having a predetermined interior volume sufficient to accommodate said items in an orderly array, said base in the jumble mode having a V-shaped trough-like configuration serving to enlarge the interior volume of said carton, whereby the arrayed items then drop into the trough-like base and assume random positions therein to create said disarray.

4,049,115

COIN HOLDER

Max Pasbrig, Orselina, Ticino, Switzerland, assignor to Lacrex Brevetti S.A., Minusio, Switzerland

Filed June 7, 1976, Ser. No. 693,700
Claims priority, application Germany, June 25, 1975, 2528324
Int. Cl.[2] A45C 11/28, 1/02
U.S. Cl. 206—.84 7 Claims



1. A holder for receiving a number of coins and the like which are stacked on top of one another comprising:

a substantially cylindrical casing having a casing wall and opposed ends;

said cylindrical casing possessing an internal crosssection essentially corresponding to the outer contour of the coins to be inserted;

a rim defining a locating edge provided at each end of the cylindrical casing for forming an end face boundary for limiting said cylindrical casing;

said cylindrical casing being provided with a longitudinal slot extending over the entire length of said cylindrical casing;

the width of said longitudinal slot being less than the diameter of each of the coins to be inserted into said cylindrical casing;

said longitudinal slot being enlarged at least at one of the ends of the casing to form a gripping opening surrounded by the rim at said one end;

said longitudinal slot being bounded by feed strips having inner guide surfaces which open outwards to form sliding surfaces for the coins to be inserted;

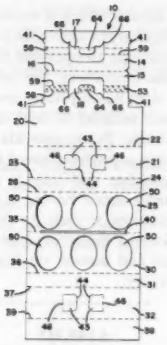
the wall and each of the rims of said cylindrical casing being formed at least in part of a flexible material to enable the longitudinal slot to expand to the width of the coins to be inserted at least in predetermined places of said longitudinal slot.

4,049,116

BOTTLE AND GLASS CARRIER

Kenneth Cope, Dayton, Ohio, assignor to Neff Folding Box Company, Dayton, Ohio

Filed Nov. 12, 1976, Ser. No. 741,471
Int. Cl.[2] B65D *85/30, 5/46, 5/48*
U.S. Cl. 206—176 **9 Claims**



1. A carrier for glasses or bottles comprising a generally vertical major divider wall, a handle portion extending upwardly from said major divider wall, means forming a cutout in said handle portion to provide a hand opening for manually grasping the carrier, a first bottom wall extending generally laterally away from said major divider wall, a first lower side wall extending generally upwardly from said first bottom wall, a first upper side wall extending generally upwardly and laterally from said first lower side wall to said handle portion, a second upper side wall extending generally downwardly and laterally from said first upper side wall and said handle portion, means forming a slot in said carrier between said first and second upper side walls for said handle portion and said handle portion passing upwardly through said slot, means forming openings through said first and second upper side walls for receiving the glasses or bottles therethrough, a second lower side wall extending generally downwardly from said second upper side wall, a second bottom wall extending generally laterally away from said second lower side wall to said major divider wall and said first bottom wall, an additional divider wall extending upwardly from said second bottom wall adjacent said major divider wall, means adhering said additional divider wall to said major divider wall, a separate separator piece passing through said handle cutout above said upper side walls, and wings on said separator piece extending downwardly above said upper side walls substantially between said openings therein for separating the tops of glasses or bottles within said openings in said carrier.

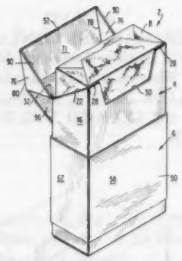
6. Two blanks for forming a carrier for glasses or bottles, the first blank comprisng a handle portion, means forming a cutout in said handle portion to provide a hand opening therein, a major divider wall extending from said handle portion, a first bottom wall foldably extending from said major divider wall opposite said handle portion, a first lower side wall foldably extending from said first bottom wall opposite said major divider wall, a first upper side wall foldably extending from said lower side wall opposite said first bottom wall, a second upper side wall foldably extending from said first upper side wall opposite said first lower side wall, means forming a slot in said blank between said first and second upper side walls, said slot having a width corresponding to that of said handle portion, means forming openings through said first and second upper side walls for receiving the glasses or bottles, a second lower side wall foldably extending from said second upper side wall opposite said first upper side wall, a second bottom wall foldably extending from said second lower side wall opposite said second upper side wall, and an additional divider wall foldably extending from said second bottom wall opposite said second lower side wall, the second blank comprising a separate separator piece having wings foldably extending from opposite sides thereof and sized for positioning within said handle cutout with said wings spaced at distances aligned substantially with the portions of said upper side walls between said openings therein.

4,049,117

PACKAGE HAVING A SLIDE ACTUATED CLOSURE MEMBER

Wolfgang H. Grimm, Richmond, Va., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Division of Ser. No. 512,957, Oct. 7, 1974, Pat. No. 3,977,520.
This application May 4, 1976, Ser. No. 682,901
Int. Cl.[2] B65D *5/38, 85/12*
U.S. Cl. 206—270 **7 Claims**



1. A blank for forming a receptacle for cigarettes or other articles comprising:

a. a rear wall panel,

b. a first side wall panel operatively connected to the rear wall panel by a first score line, the upper edge of the side panel being diagonal from a lower point adjacent the rear panel to an upper point,

c. a front wall panel operatively connected to said first sidewall panel by a second score line opposite said first score line, the upper edge of said panel at each side thereof is at the elevation of the upper point of the diagonal top edge of the first side panel and the center portion of the upper edge is recessed relative thereto,

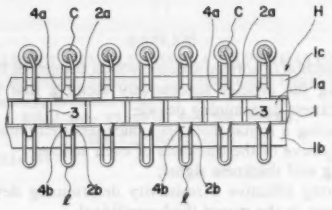
d. a second sidewall panel operatively connected to the front wall panel by a third score line opposite the second score line, the upper edge of the side panel being diagonal from the upper edge of said front panel downwardly in a manner generally corresponding to the upper edge of said first sidewall panel,
e. at least one bottom panel connected to one of the front and rear panels by a fourth score line,
f. a glue flap connected to the top edge of the rear wall panel by a fifth score line.

4,049,118

HOLDING DEVICE FOR ELECTRICAL AND ELECTRONIC PARTS

Fumio Honda, Kyoto; Tsuneo Taki, Hakui, and Masatoshi Kajiwara, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Aug. 31, 1976, Ser. No. 719,383
Claims priority, application Japan, Oct. 3, 1975, 50-135858
Int. Cl.[2] B65D *73/02*
U.S. Cl. 206—330 **10 Claims**



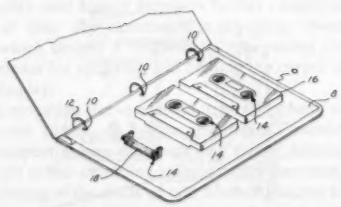
1. A holding device for holding therein a plurality of electrical and electronic components at the lead wire portions thereof with regular intervals thereinbetween, said holding device comprising:
a base member of tape-like configuration;
a plurality of holding means for holding said electrical components spaced from each other longitudinally along said base member, each holding means comprised of:
a first hinge-like tongue member cut from said base member perpendicular to the longitudinal direction of said base member, whereby said lead wires can be inserted into said base member through said cut therein and held therein by said tongue member pressed into said cut and forcing said lead wires between the side of said tongue member and said cut.

4,049,119

TAPE CASSETTE FILING UNIT

Robert B. Wilson, Holyoke, Mass., assignor to National Blank Book Company, Inc., Holyoke, Mass.

Filed May 17, 1976, Ser. No. 687,154
Int. Cl.[2] B65D *85/672, 85/67, 25/02*
U.S. Cl. 206—387 **4 Claims**



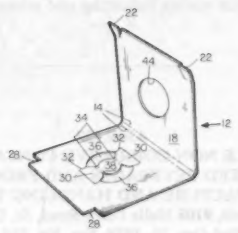
1. Filing unit for tape cassettes comprising a base sheet, at least one cassette retainer clip affixed to the surface of said sheet, said clip including a base and upwardly extending post portions, said post portions being spaced apart a distance approximately equal to the spacing between reels of said tape cassette, each of said post portions including outwardly extending lugs to engage the inner surface of the reel opening of said cassette.

4,049,120

TAPE REEL SHIPPING FOLDER

Thomas E. Bower, Long Beach, Calif., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 29, 1976, Ser. No. 671,890
Int. Cl.[2] B65D *85/67*
U.S. Cl. 206—396 **2 Claims**



1. A tape reel shipping folder for packaging a reel of tape, wherein the tape is tightly wound into an annular reel about an annular reel hub, the annular reel hub having a thickness greater than the thickness of the tape, said shipping folder comprising a pair of folder panels hingedly connected and adapted to be folded into overlying relationship with the reel of tape positioned therebetween, one of said folder panels including a pair of hub-locking tabs hingedly attached to said folder panel and foldable into underlying, surface-to-surface contact with said folder panel and into free edge-abutting relationship with each other to form a substantially circular locking member adapted to fit within and continuously contact a major portion of the circumference of a center opening in said annular reel hub to position said reel of tape between said folder panels and a reduced thickness region overlying said annular reel hub and being adjacent to said hub-locking tabs to accomodate the greater thickness of said annular reel hub and allow said folder panel to flushly contact and securely hold said tape wound on said annular reel hub, and folder locking means formed on said pair of folder panels and locking said folder panels into engagement around said reel of tape.

4,049,121

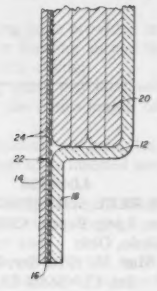
MOISTURE DETECTION SYSTEM FOR A STERILE PACKAGE

Leonard Alan White, Gurnee, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed July 14, 1976, Ser. No. 705,212
Int. Cl.[2] A61B *19/02*; B65P *77/22*; G01D *13/00*; A22C *17/10*
U.S. Cl. 206—439 **17 Claims**

1. A system for detecting water contamination which com-

prises: a package having sterile unfrozen contents covered by a gas permeable barrier; a water soluble dye pattern in said



package, said pattern adapted to bleed in response to water in said package, for visibly indicating said water contamination.

4,049,122

NESTABLE NON-CORROSIVE CONTAINER FOR PRESSURIZED BEVERAGES AND PROCESSES FOR MANUFACTURE AND HANDLING THEREOF

Earl G. Maxwell, 9108 Halls Ferry Road, St. Louis, Mo. 63136

Filed Oct. 21, 1974, Ser. No. 516,378
Int. Cl.[2] B65D *21/02, 7/48, 17/24*
U.S. Cl. 206—519 **12 Claims**

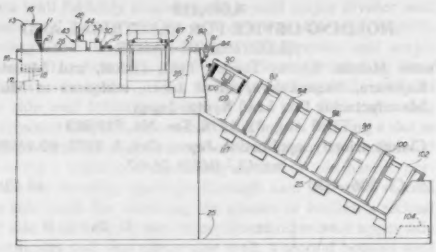
1. A returnable and refillable metal container for pressurized beverages or the like, comprising a one-piece seamless container body having a frusto-conical side wall and an integral bottom end wall forming an interior cavity to be filled with pressurized beverage, said container body also having an open top end with means adapted to receive and sealably hold a rupturable closure seal thereon against pressures exerted by the beverage within the container, means projecting radially from said side wall between the top and bottom ends and forming an abutment ledge in predetermined spaced relation with one of said top and bottom ends, said container body being adapted to nestably receive a similar container body in any relative circumferential position thereof in non-wedging contact with said abutment ledge means to maintain the side and bottom end walls of the first and similar nested containers in a spaced-apart and non-locking condition for subsequent unrestricted separation for use, said interior cavity being defined by a permanently non-corrosive metal surface which, upon sterilization, is chemically inert to the pressurized beverage, said container body being of predetermined strength and rigidity, and said container being adapted to be used and repeatedly returned for immediate reuse in substantially the original manufactured condition of the container after sterilization of the container.

4,049,123

METHODS OF AND APPARATUS FOR SORTING ARTICLES IN ACCORDANCE WITH THEIR RESISTIVITY AND THICKNESS

Charles R. Fegley, Laureldale; Richard H. Winings, Lawrence, and Clifford R. Yeich, Jr., Reading, all of Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Filed June 1, 1976, Ser. No. 691,804
Int. Cl.[2] B65G *47/34*
U.S. Cl. 209—74 M **13 Claims**



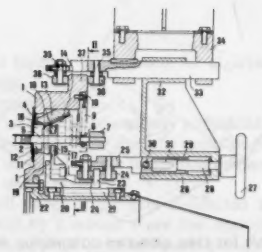
1. A method of sorting articles, which comprises the steps of:
moving the articles successively along a first track to a thickness determining device;
producing a signal from said thickness determining device indicative of the thickness of each article;
storing said thickness signal;
rendering effective a resistivity determining device in response to the stored thickness signal;
continuing to move the articles successively along the track and to the resistivity determining device;
producing a signal from said resistivity determining device indicative of the resistivity of each article;
storing said resistivity signal;
continuing to move each article successively along the first track onto a second track; and
moving each article in response to said stored signals successively along the second track into a preselected position associated with both the thickness and resistivity of each article.

4,049,124

SORTING MACHINE FOR ELONGATED ARTICLES

Joseph Coppolani, Meudon la Foret, and Leon Vandernotte, Rueil-Malmaison, both of France, assignors to Societe Franco-Europeenne de Material pour l'Industrie Alimentaire "F.E.M.I.A" France, Paris, France

Filed Mar. 25, 1976, Ser. No. 670,269
Claims priority, application France, Apr. 2, 1975, 75.10243
Int. Cl.[2] B07C *5/04*
U.S. Cl. 209—98 **9 Claims**



1. In a sorting machine for elongate articles in which fixed and movable bars are disposed alternately around a rotary

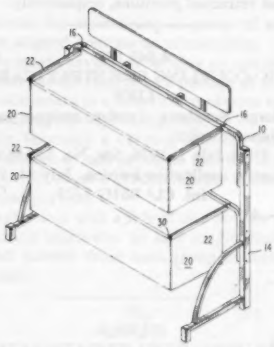
drum having a bearing flange, an adjustment assembly for adjusting the spacing between said fixed and movable bars, said adjustment assembly being operative when said sorting machine is in operation and including parts with radial slots accommodating said movable bars for sliding displacement therein, means for displacing said movable bars in said slots comprising cam members associated with said movable bars and inclined with respect to the axis of the drum, means mounting said cam members on the bearing flange of the drum, cam followers freely slidably mounted on said movable bars, resilient return means constantly urging said cam followers in contact with said cam members and in a direction corresponding to a limit position of said movable bars in said radial slots, slide control members for controlling the sliding of said cam followers along said movable bars, and means independent of the rotation of the drum for displacing said slide control members in unison, parallel to the axis of the drum.

4,049,125

CARPET SAMPLE DISPLAY APPARATUS

Barnett B. Rochestie, Trenton, N.J., assignor to Royal Engineering Company, Trenton, N.J.

Filed July 27, 1976, Ser. No. 709,037
Int. Cl.² A47F *7/16*
U.S. Cl. 211—47 **10 Claims**



1. A carpet sample display apparatus comprising:

a. a plurality of pivotally moveable hanger arms;

b. support means for holding said hanger arms in spaced relation, with respect to one another and the surrounding environment, said hanger arms being pivotally movably mounted within said support means; and

c. a plurality of hanger members for holding a plurality of carpet samples extending downwardly therefrom for display, said hanger members further comprising:

1. at least one downwardly extending channel means which defines a longitudinally extending channel slot means for receiving and holding the carpet samples for display;

2. a mounting sleeve adapted to receive one of said hanger arms therein to secure said hanger member to said support means, said mounting sleeve defining a sleeve slot means extending longitudinally therealong to allow flexing of the walls of said mounting sleeve to facilitate gripping of said hanger arms; and

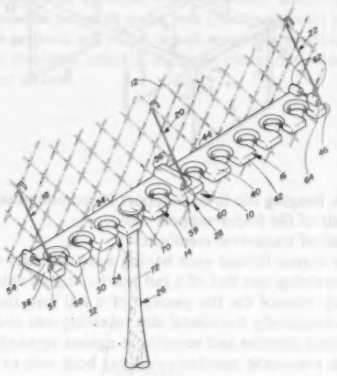
3. tab means along the edges of said channel slot means and extending into said channel means to hold displayed carpet samples therein.

4,049,126

WEIGHT EQUALIZED FOLDABLE BAT RACK

Lance K. Halverson, Seattle, Wash., assignor to Rolf Sporting Goods, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 589,016, June 23, 1975, abandoned. This application Mar. 26, 1976, Ser. No. 670,637
Int. Cl.² A47F *5/08*
U.S. Cl. 211—104 **14 Claims**



1. A bat rack with a first, open, configuration attachable to an open weave fence for the storage of baseball bats and a second, closed, configuration for transporting the rack, comprising:

a first and second support bar for receiving a plurality of bats, each having front and rear edges, spaced ends, an upper surface, and forward opening recesses spaced along its length and communicating with said front edge to separately receive and hold each bat in a substantially vertical position, each recess having a width smaller than the width of the handle knob of the bat;

a first and second hanger pivotally connected to said first support bar, each hanger including a forward opening hook attachable to the open weave fence, said hangers being positionable normal to said upper surface in the first open configuration of said bat rack, and said hooks being engageable with the fence at a point forward of said rear edge and above said upper surface, and said hangers also being rotatable to a position parallel to and contacting said upper surface of said first support bar in the second closed configuration of said bat rack;

a hinge disposed between said first and second support bars and attached near adjacent joined ends of said first and second support bars, said adjacent joined ends abutting in the first configuration thereof;

a third hanger pivotally connected to said second support bar near the free end thereof, said third hanger also including a forward opening hook attachable to the open weave fence forward of said rear edge of said second support bar;

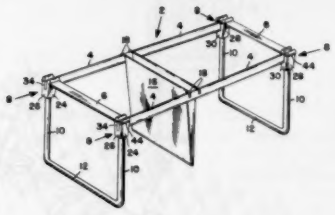
whereby in the first open configuration thereof the moments tending to tilt the bat rack are partially equalized by said hangers engaging said open weave fence forward of said rear edge of each support bar and whereby said bat rack is foldable to a size of lesser overall dimensions in the second configuration thereof.

4,049,127

HANGING FILE FOLDER SUPPORT FRAME

Robert L. Alexander, Erlanger, Ky., assignor to Hunt Manufacturing Co., Philadelphia, Pa.

Filed Aug. 30, 1976, Ser. No. 718,561
Int. Cl.[2] A47F 5/10
U.S. Cl. 211—189 **9 Claims**



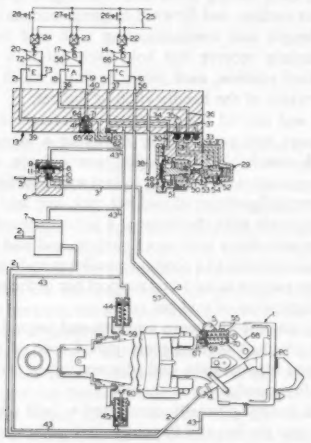
1. A hanging file folder support frame comprising:
a pair of file folder support rails,
a pair of transverse members,
four corner fittings each having a substantially vertical slot receiving one end of a rail and having an entrance at the top thereof for the passage of a rail into the slot and a substantially horizontal slot receiving one end of a transverse member and securing it against upward movement.
each transverse member overlying both rails to prevent the upward movement of the rails, and
a leg supporting each corner fitting.

4,049,128

CONTROL SYSTEM FOR AUTOMATIC RAILWAY CAR COUPLER

William B. Jeffrey, North Huntingdon, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Nov. 18, 1976, Ser. No. 742,772
Int. Cl.[2] B61G 5/08, 5/10
U.S. Cl. 213—1.6 **8 Claims**



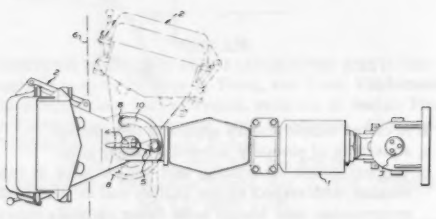
1. Control apparatus for an automatic railway car coupler comprising one mating head, including an electrical contact portion for connecting electrical train circuitry and a pipe connector portion for connecting fluid pressure train lines, said mating head being carried on one car and adaptable for coupling with a counterpart mating head on another car for automatically and concurrently effecting coupling of the cars and connection of the respective electrical circuitry and pipe lines of the train, said control apparatus comprising:
a. a source of fluid under pressure;
b. normally open cut-out valve means interposed in the respective fluid pressure train lines and operable, in response to actuating fluid pressure, to respective closed positions for interrupting flow through said train lines;
c. centering means carried by the respective mating heads in normally disengaged positions relative to the mating heads and operable, responsively to actuating fluid pressure, to respective abutting positions with the mating heads and in which said mating heads are positioned in axial alignment with each other prior to coupling engagement;
d. retracting means disposed on the respective mating heads and operable, in response to actuating fluid pressure, to respective retracted positions in which electrical contact blocks of the electrical portions of the mating heads, respectively, are electrically disengaged from each other;
e. latching means carried by the respective mating heads normally biased to respective latching positions for locking the mating heads, upon engagement, in a coupled relation and being operable, in response to actuating fluid pressure, to an unlatching position for releasing the mating heads from said coupled relation prior to disengagement thereof; and
f. actuating means operable, at will, for effecting supply of actuating fluid pressure from said source to said latching means for effecting sequential operation thereof to their unlatching positions subsequently to concurrent operation of said cut-out valve means, said centering means, and said retracting means to their closed positions, abutting positions, and retracted positions, respectively.

4,049,129

AUTOMATIC COUPLING FOR STREETCARS AND THE LIKE

Olof Sune Bergs, Sundborn, Sweden, assignor to AB Dellner-Malmco, Falun, Sweden

Filed July 1, 1976, Ser. No. 701,561
Claims priority, application Sweden, July 14, 1975, 7508039
Int. Cl.[2] B61G 7/12
U.S. Cl. 213—4 **4 Claims**



1. In an automatic coupling for streetcars and similar railborne vehicles, the coupling comprising:
a. a connecting rod pivotally connected to the vehicle; and
b. a coupling head pivotally connected to the connecting rod, the improvement that the coupling head is pivotal in the horizontal plane between an operative position in an extension of the connecting rod, in which position the coupling head projects beyond the front profile of the vehicle, and an inoperative position beside the connecting rod, in which position the coupling head is located inside the front profile of the vehicle; and that the coupling head cooperates with a locking device by means of which the coupling head may be locked to the connecting rod at least in said operative and inoperative positions; said locking device including a cone or the like which, in the locking positions, may be lodged in corresponding recesses; said cone being lodgably connected to a pin provided on

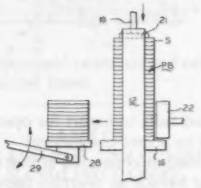
said connecting rod or said coupling head, said pin extending through a groove in said coupling head or said connecting rod, said groove being curved and having the pivotal center of the coupling head as its center of curvature, and said groove being provided with said recesses corresponding to said locking positions.

4,049,130

APPARATUS FOR HANDLING AND MOVING ARTICLES

John T. Bell, St. Charles, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 16, 1976, Ser. No. 667,254
Int. Cl.[2] B65G *59/06*
U.S. Cl. 214—8.5 A **2 Claims**



1. Apparatus for moving a portion consisting of a predetermined number of yieldable flat articles, such as paperback books or the like, from a group of such articles disposed with the sides thereof in contiguous relationship, said apparatus comprising:

a. guide means for maintaining a group of said yieldable articles in aligned contiguous relationship;

b. said guide means having an opening on one side thereof to accomodate the movement of a portion of said group out of side guide means in a direction transverse to a longitudinal axis passing through said group;

c. means for imposing a varying pressure load along the longitudinal axis of said group so that the compression of said group will cause a predetermined number of articles to be in said portion;

d. means engageable with a side of said portion and movable in a direction transverse to said longitudinal axis to remove said portion from said group maintained in said guide means.

4,049,131

FREIGHT CONTAINER UNLOADING SYSTEM

William L. Schrader, Orchard Lake, and Harold T. Rose, Sterling Heights, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1975, Ser. No. 595,188
Int. Cl.[2] B65G *63/00*
U.S. Cl. 214—14 **4 Claims**

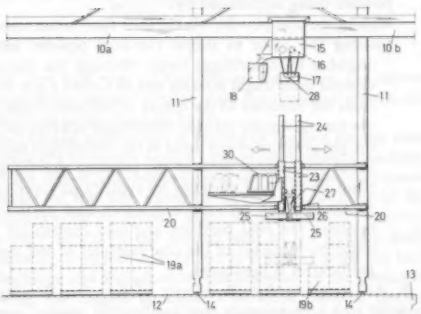
1. A transport system for moving a multi-ton freight container from a beached watercraft to a waiting vehicle located on firm terrain; said system comprising two parallel rows of anti-friction support units positionable on the beach at spaced points along a path leading from the beached watercraft to the waiting vehicle; the two rows of support units being spaced apart by a distance that is greater than the craft width or vehicle width; the support units having termination points alongside the beached watercraft and waiting vehicle; a sled of tunnel shape supported for translatory movement along the support units from a starting position straddling the watercraft to a delivery position straddling the waiting vehicle; hoist means carried by the sled for initially lifting the freight container from the watercraft and later lowering the freight container onto the waiting vehicle; and winch-cable means for towing the sled over successive ones of the anti-friction support units to thereby transport the container from the watercraft to the vehicle; each anti-friction support unit comprising a terrain-engageable pedestal, a roller-mount assembly **(73)** located above the pedestal, and a jack **(76)** operatively trained between the pedestal and roller-mount assembly for selectively locating the mounted roller at different elevations relative to the subjacent terrain.

4,049,132

CRANE ADAPTED TO THE HANDLING OF UNIFORM CARGO UNITS

Per Strömbäck, Lindome, Sweden, assignor to Salen & Wicander Terminalsystem AB, Goteborg, Sweden

Filed Sept. 9, 1976, Ser. No. 721,713
Claims priority, application Sweden, Sept. 12, 1975, 7510168
Int. Cl.[2] B66C *19/00*
U.S. Cl. 214—14 **5 Claims**



1. Means for handling cargo units of uniform size at a quay having a ranging area and adapted for mooring a ship along its water edge, and comprising

a crane extendable over said ranging area and reaching outside the quay's water edge and having lifting means being terminated by a yoke for piecemeal engaging said cargo units,

guiding means at two opposite edges of said yoke,

an operator's cage at an elevated level at said crane,

a gantry means extendable over said ranging area and located at a lower level than said operator's cage,

a trolley movable along said gantry means and an operator's seat at said trolley, and

two guides at said trolley located oppositely to each other and each having a guide member for cooperating with the guide means at said yoke.

4,049,133

PROCESS AND APPARATUS FOR THE SUPPLY OF A DRY, FREE-FLOWING COAL POWDER TO A HIGH-PRESSURE COAL GASIFICATION REACTOR

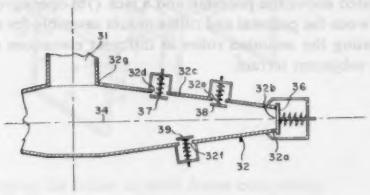
Gernot Staudinger, Amsterdam, Netherlands, assignor to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Apr. 14, 1976, Ser. No. 676,725

Claims priority, application Netherlands, Apr. 24, 1975, 7504844

Int. Cl.[2] B65G *65/32*

U.S. Cl. 214—17 B 10 Claims



1. In a process for the supply of a dry, free-flowing coal powder to a high-pressure coal gasification reactor, wherein the coal powder is introduced by means of a centrifugal pump into a chamber brought under high pressure with an inert gas and wherein the coal powder is passed from the high-pressure chamber into a reactor space of a high-pressure coal gasification reactor by means of a dosing apparatus communicating therebetween, the improvement comprising:

introducing the coal powder into the pressurized chamber via a centrifugal pump comprising an inlet tube passing through a wall of the chamber and a rotatable rotor connected with the inlet tube and disposed in the chamber, said rotatable rotor including a plurality of outwardly tapering centrifugal nozzles disposed in a radial position with respect to the axis of rotation of the rotor, said coal powder being introduced by:

feeding the coal powder via the inlet tube to the rotor; and

rotating the rotor to throw the coal powder into the chamber by centrifugal forcce through the outwardly tapered centrifugal nozzles and to create a gas leakage from the chamber to the center of the centrifugal pump via the outwardly tapered centrifugal nozzles such that the gas pressure at any point in the centrifugal nozzles is about 70 to about 90% of the pressure exerted at that point on the coal particles by centrifugal force and by frictional force between respective coal particles and between the coal particles and said centrifugal pump whereby blockage of the coal particles in said centrifugal nozzles is prevented.

8. An apparatus for the supply of dry, free-flowing coal powder to a high-pressure coal gasification reactor, comprising:

a high-pressure chamber, including means for supplying gas to the chamber to provide high pressure therein, and centrifugal pump means for supplying coal powder to the chamber under high pressure, said centrifugal pump means comprising:

an inlet tube passing through a wall of the high-pressure chamber; and

a plurality of rotatable centrifugal nozzles grouped to form a rotor connected with the inlet tube and disposed in the chamber in a radial position relative to the inlet tube, each of said centrifugal nozzles respectively tapering outwardly from said inlet tube and having a longitudinal inverse trumpet shape; and

a dosing apparatus means for passing the coal powder from the high pressure chamber to a high-pressure coal gasification reactor.

4,049,134

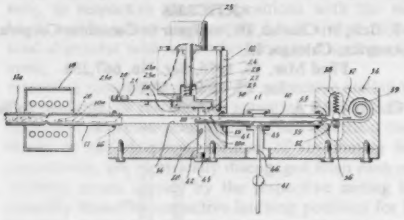
MOVABLE LADLE IN A PRESSURIZED CONDUCT FOR TRANSPORTING SPECIMENS TO A COMBUSTION CHAMBER

Igor E. Dolgen, Monroe, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 2, 1976, Ser. No. 654,426

Int. Cl.[2] B65G *65/30*; G01N *1/00*

U.S. Cl. 214—29 6 Claims



1. A pressurized ladle transport for operation between supply and delivery locations, comprising:

an elongated conduit connected at one end to the delivery location and having an aperture thereinto at the supply location;

an elongated ladle slideably disposed within said conduit and having a spoon portion on the end thereof that is directed toward the delivery location;

a housing connected to the other end of said conduit;

a flexible tape connected to the other end of said ladle and extending into said housing, the length of said tape being sufficient to extend from within said housing when said spoon portion on said ladle is at the delivery location;

means for driving said tape bidirectionally relative to said housing;

means for storing said tape within said housing; and a source of gas connected to pressurize said conduit, said source being at a pressure greater than the atmosphere exterior to said conduit, said drive means being controllable to move said tape in positioning said ladle at either the supply or delivery locations with material being deposited on said spoon portion thereof through said aperture at the supply location and the environment within the ladle transport being uncontaminated by the exterior atmosphere due to the pressurization therein.

4,049,135

CONTAINER HANDLING ARRANGEMENT WITH CHASSIS ADAPTER FRAME

John J. Glassmeyer, Covington, Ky., assignor to Pullman Incorporated, Chicago, Ill.

Filed Apr. 30, 1976, Ser. No. 681,998

Int. Cl.[2] B65G *67/02*

U.S. Cl. 214—38 CC 13 Claims

10. For a cargo container having a light-weight wall structure which is susceptible to destruction during conventional transshipment handling such as upon a highway vehicular chassis;

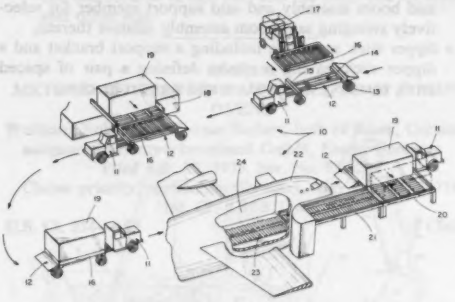
a temporary transporter frame cradling the container and providing an underframe therefor,

first locking means for releasably securing said transporter frame to said wall structure of the container in supportive rigidfying relation,

second locking means adapted for releasably securing said transporter frame to the vehicular chassis, and

means on said transporter frame interposed between the same and said cargo container providing limited slide surface areas to facilitate removal of said container off said

transporter frame for deposit upon an adjacent limited load-carrying cargo transport adapted to receive and



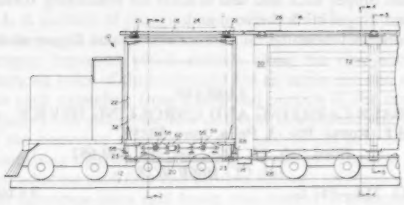
adequately support said container and cargo therein without said transporter frame.

4,049,136

PRIME MOVER AND BOX CAR COMBINATION FOR HANDLING CARGO

Warren O. Fleenor, 8250 W. Bergen Road, LeRoy, N.Y. 14482

Filed Dec. 22, 1975, Ser. No. 643,086
Int. Cl.² B60P *1/44*
U.S. Cl. 214—38 R **12 Claims**



7. An improved prime mover for use in conveying a box car between cargo handling stations for loading and unloading cargo comprising:

a prime mover frame having a movable support rail separate from a box car to be conveyed and movable to an extended operating position; and

a cargo handling mechanism carried by said support rail of said prime mover and slidably mounted and positioned on said support rail in said extended operating position, and movable from said extended operating position of said support rail to the box car for loading and unloading cargo therefrom.

4,049,137

HAULING VEHICLE WITH SIDE DUMP BODY

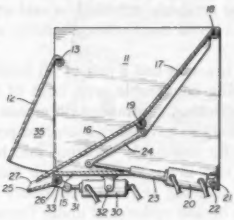
Gustave Meyer, Northglenn, Colo., assignor to Irvin L. Stumpf, Wheat Ridge, Colo., a part interest

Filed Jan. 27, 1976, Ser. No. 652,837
Int. Cl.² B60P *1/00*
U.S. Cl. 214—82 **3 Claims**

1. An improved side dump hauling body, adapted for heavy duty, of the kind having a pair of stationary end walls running between first and second sides of the hauling body, a stationary bottom wall connecting the lower edges of the end walls and an ejector hingedly attached at its top edge at the top of the second side of the hauling body, and moveable from a retracted to an extended position, and wherein the improvement comprises:

a. a free swinging side panel hingedly attached at its top edge at the top of said first side of the hauling body and depending from said hinge in substantially vertical position for sealing said first side in cooperation with said first and second end walls and said stationary bottom wall, and being swingable outwardly from sealing position in response to pressure of the load carried within the body to open sufficiently for load discharge;

b. said ejector comprising a first ejector plate depending from said hinged attachment at the top of the second side of the hauling body and substantially closing said second side, and a second ejector plate having a hinge attaching a first edge to the lower edge of the first ejector plate, the second plate having a second edge opposite said first edge and supporting the second plate in slidable contact with said stationary bottom wall, the second ejector plate forming an acute angle between its lower side and the stationary bottom wall and having its second edge substantially spaced from the first side of the hauling body when the ejector is in retracted position, the spacing between the second ejector plate and the first side of the hauling body allowing a load within the hauling body to be partially supported on the stationary bottom wall and partially supported on the second ejector plate, the acute angle with the bottom wall allowing the second plate to initiate shifting of the load toward the free swinging side without the second plate having to lift the entire mass of the load, the second ejector plate sliding on its second edge over the stationary bottom wall to the first side of the hauling body during movement into extended position and sliding with the bottom face of the second ejector plate against



the first side edge of the bottom wall when the second edge of the second ejector plate has extended outside the first side of the hauling body;

c. said hinged attachment at the top of the first ejector plate being at a relatively higher vertical position than the hinge at the top of the free swinging side, the relatively lower height of the free swinging side aiding loading of the hauling body by ground based loaders, and the relatively greater height of the second side of the hauling body allowing the ejector to extend in a steeper angle for load discharge and also allowing the first plate of the ejector to swing the hinged attachment between the two ejector plates along an arc of increased radius, during ejector extension initially moving said second ejector plate with a greater horizontal component for inducing shifting of a load toward the free swinging side without undue lifting of the load;

d. ejector activating means for swinging the ejector on said hinge at the top of the second side of the hauling body, moving the hinged connection between the two ejector plates toward the free swinging side during ejector extension, the connection between the activating means and the ejector allowing the two ejector plates to be moved beyond a single plane position when the ejector is fully extended; and

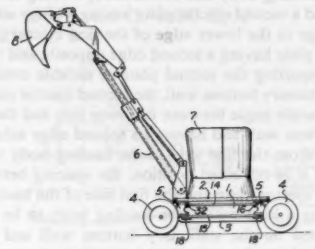
e. latching means for holding the free swinging side panel in position sealing said first side of the hauling body when the load is to be retained in the hauling body, and being releasable independently of the operation of said ejector activating means in connection with load discharge.

4,049,138

EXCAVATOR HAVING ADJUSTABLE WHEELS

Ingebret Soyland, Solhogda 2 Brynehaugen, Bryne, Norway (N-4340)

Filed July 18, 1975, Ser. No. 597,227
Claims priority, application Norway, July 19, 1974, 7422642
Int. Cl.[2] B62D *61/00*; E02F *9/02*
U.S. Cl. 214—132 **2 Claims**



1. An excavator, comprising:
an under frame, said under frame being generally cylindrical and including vertical wall means;
upper and lower circular, continuous rib means forward on the exterior of said vertical wall means of said cylindrical under frame, said upper and lower rib means lying in parallel, generally horizontal planes;
an upper frame rotatably mounted on said under frame, and supporting a boom and bucket assembly, and an operator cabin;
a pair of fore brackets and a pair of aft brackets, all of said brackets being engageable with both of said upper and said lower circular, continuous rib means and being slidable therealong to any desired selected position;
clamp means for releasably securing said brackets to said upper and said lower continuous rib means in selected locations therealong about the periphery of said vertical wall means of said cylindrical under frame;
a horizontally elongated arm pivoted at one end thereof each of said brackets, for pivotal movement in a horizontal plane; and
means for releasably securing said elongated pivoted arms to their associated brackets in a selected pivoted relationship; and
wheel means carried on the free, other end of each of said arms, said brackets being movable about the periphery of said cylindrical under frame to vary the width between said wheel means at the fore end and the aft end of said excavator, and said arms being adjustable relative to their associated brackets to properly align said wheel means.

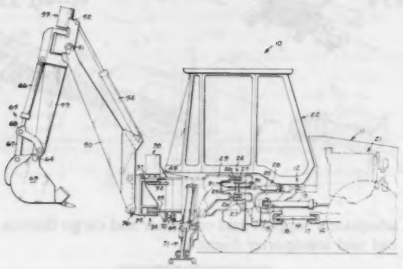
4,049,139

BACKHOE WITH MULTI-MOVEMENT CAPABILITIES

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 25, 1976, Ser. No. 661,088
Int. Cl.[2] E02F *3/75*
U.S. Cl. 214—138 R **26 Claims**

1. A backhoe comprising
a frame,
a support member,
first pivot means pivotally mounting said support member on said frame for horizontal pivotal movements relative thereto,
first actuating means operatively interconnected between said support member and said frame for selectively pivoting said support member relative thereto,
a boom assembly,
second pivot means pivotally mounting a lower end of said boom assembly on said support member for horizontal pivotal movements relative thereto,
second actuating means operatively interconnected between said boom assembly and said support member for selectively swinging said boom assembly relative thereto,
a dipper stick assembly, including a support bracket and a dipper stick having a clevis, defining a pair of spaced arms, rotatably mounted on said support bracket,



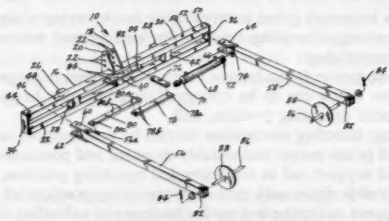
third pivot means pivotally mounting said support bracket on an upper end of said boom assembly for vertical pivotal movements relative thereto,
third actuating means operatively interconnected between said support bracket and said boom assembly for selectively pivoting said dipper stick assembly relative thereto,
fourth actuating means operatively interconnected between said dipper stick and said bracket for selectively rotating said dipper stick thereon, and
a work tool mounted on a lower end of said dipper stick.

4,049,140

BALE CARRYING AND UNROLLING DEVICE

Gerald L. Roose, Rte. 3, Pella, Iowa 50219

Filed Feb. 23, 1976, Ser. No. 660,662
Int. Cl.[2] B66F *9/18*
U.S. Cl. 214—147 G **7 Claims**



1. A bale carrying and unloading device for use with a three-point hitch or the like, said device comprising:
a cross-bar frame structure with a plurality of horizontally spaced apart vertical apertures,
securing means on said frame to secure said frame to an implement hitch of a prime mover,
a pair of spaced apart rearwardly extending arms pivotally mounted by hinge means on said cross bar frame structure for pivotal movement about a vertical axis,
said hinge means comprising a pin for pivotally mounting each of said arms to said cross bar, said pin being received within one of said apertures in said cross bar frame and being selectively movable to other of said apertures,
a hydraulic cylinder having an extendable and retractable ram at one end and mounted at its opposite end to one of said arms, said ram being operatively secured to said other arm for selectively effecting the pivoting of said arms towards and away from one another, and

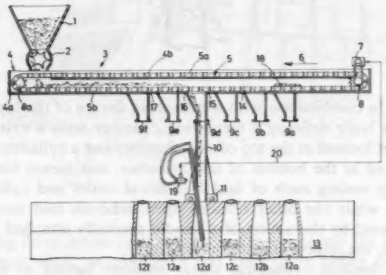
a cylinder movement strap of adjustable length to adapt to lateral adjustment of the pivotal axis of said arms having one end secured to said ram and the other end secured to said other arm.

4,049,141

METHOD OF CHARGING A PLURALITY OF COKING OVENS

Wolfgang Rohde, and Werner Siebert, both of Essen, Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed Apr. 30, 1975, Ser. No. 573,284
Claims priority, application Germany, May 4, 1974, 2421615
Int. Cl.[2] C10B *31/04*
U.S. Cl. 214—152 **9 Claims**



1. A method of charging a plurality of coking ovens which are arranged in a horizontal row, by means of an endless scraper conveyor which extends along the row above the charging holes of the ovens and has an upper run and a lower run each extending from a first end portion of the conveyor adjacent one end of the row of ovens to a second end portion of the conveyor adjacent another end of the row of ovens, comprising the steps of admitting a quantity of coal at a location adjacent said first end portion through said upper run of said conveyor onto said lower run thereof; transporting the coal on said lower run lengthwise of said row in direction from said one end towards said other end of said row; charging coal from said lower run into the charging holes of said ovens in a sequence which begins with an oven closer to said other end than to said one end and which progresses counter to said direction of transportation to ovens which are successively closer to said one end while skipping intermediate ovens; terminating the charging of the respective ovens in response to generation of a signal indicating that a predetermined filling level has been reached in the charging hole of the oven; conveyinng any residual portions of the coal which have not been discharged from the lower run by the time respective increments of the lower run reach said second end portion of the conveyor, from said lower run onto said upper run and thereon counter to said direction towards said first end portion; and discharging said residual portions of coal from said upper run onto said lower run at said location adjacent said first end portion of the conveyor.

4,049,142

AUTOMATIC MACHINE FOR UNLOADING AND RELOADING OF PLATES IN CASSETTES, PARTICULARLY RADIOGRAPHS

Cesare Azzaroni, Bologna, Italy, assignor to Cesare Azzaroni, Bologna, Italy

Filed Feb. 27, 1976, Ser. No. 662,043
Claims priority, application Italy, Feb. 27, 1975, 3346/75
Int. Cl.[2] B65G *65/04*
U.S. Cl. 214—301 **7 Claims**

1. Automatic machine for receiving a cassette with an exposed plate, having any of a wide variety of sizes, opening the cassette, unloading the exposed plate, reloading with an unexposed plate of appropriate size, and closing and ejecting the cassette, comprising:

a loading plane, including first sensor means for detecting the presence of a cassette thereon, and further including the input and output station means, which contain a means for hermetic protection against light, for gripping and conveying the cassettes inside the machine when the presence of a cassette is detected by said first sensor means and for taking the cassettes out of the machine;

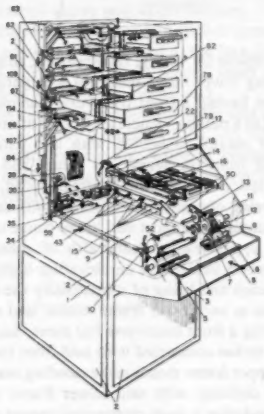
a first conveyor means, placed behind said input and output station means, for receiving the entering cassette and for transferring the cassette inside the the machine;

control means, including a first stop, for stopping the movement of said first conveyor means and for changing the direction of said first conveyor means to supply said input and output station means with the reloaded cassette during the phase of ejection of the cassette form the machine;

a pushing means for the positioning of the cassette in orthogonal direction with respect to the moving direction of the cassette on said first conveyor means;

second sensor means, placed laterally to said first conveyor means for determining the span of said pushing means and for detecting the lateral dimension of the cassette;

unlocking means for unlocking of the cassette, placed above said first conveyor means, the operation of said unlocking means being controlled by said second sensor means;



opening means, operating in synchronization with said unlocking means, for rotating the cassette cover from the originally closed position into the open position of the cassette, said opening means including first suckers;

plate removing means for taking off the exposed plate, from inside the cassette, said plate removing means being timed with said opening means and including second sucker means for taking the plate out of the cassette and transferring the plate onto a second conveyor means, placed inside a tunnel with hermetic protection against light, for the output of the plate from the machine;

a plurality of magazine drawers for storing plates to be forwarded singly to the cassettes, from where the exposed plate had been previously taken off;

a plurality of feeding ducts, each having an inlet corresponding to one of said magazine drawers;

a plurality of plate transfer means, one corresponding to each of said magazine drawers, for taking a plate from one of said magazine drawers and transferring the plate to the corresponding one of said feeding duct inlets, each of said plate transfer means including second suckers to hold the plates, the particular plate transfer means which is activated, corresponding to the desired magazine drawer, being controlled by said second sensor means and the position of said pushing means;

loading means for transferring the plate from said feeding ducts to the open cassette; and

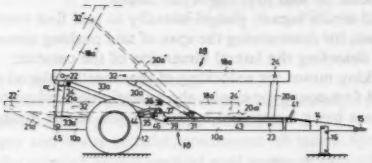
closing means for closing and locking the cover of the cassette, thereby preparing the reloaded cassette for ejection by said input and output station means.

4,049,143

TRAILER-TYPE VEHICLE FOR LIFTING, TRANSPORTING, AND DEPOSITING LOADS

Vesa Hatakka, Helsinki, and Jussi Sarvela, Espoo, both of Finland, assignors to Oy Innovation Services Co., Finland

Filed July 27, 1976, Ser. No. 709,096
Claims priority, application Finland, Jan. 19, 1976, 760113
Int. Cl.[2] B60P *1/34*
U.S. Cl. 214—390 **14 Claims**



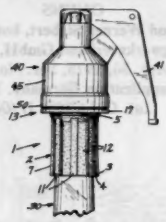
1. A vehicle for lifting, transporting, and depositing a load, comprising lower frame means of substantially U-shaped configuration having a front transverse bar means adapted to be attached to a pulling vehicle and a pair of opposed side longitudinal bar means connected with and extending rearwardly from said front transverse bar means and defining with the latter a space for accommodating a load, at least a pair of wheels being operatively connected with said pair of opposed side bar means to support said lower frame means during travel thereof, upper frame means also of substantially U-shaped configuration situated at an elevation higher than said lower frame means and being of substantially the same size and configuration as said lower frame means, said upper frame means also having a front transverse bar means and a pair of opposed side bar means connected with said front transverse bar means of said upper frame means and extending rearwardly therefrom for also defining with said lower frame means a space for accommodating a load, connecting means extending between and interconnected with said lower frame means and said upper frame means for connecting said upper frame means to said lower frame means for movement with respect thereto downwardly to a lower load-receiving position and upwardly to an upper load-transporting position, said connecting means also providing for said upper frame means a transverse pivot axis about which said upper frame means turns when carrying out a load-depositing operation, a pair of expandable and contractable fluid-pressure means respectively situated on opposite sides of and beyond the load-accommodating space defined by said upper and lower frame means with each of said fluid-pressure means being operatively connected to a side bar means of said lower frame means and a side bar means of said upper frame means for lowering said upper frame means from said upper load-transporting position thereof down to said lower load-receiving position thereof during expansion of each fluid-pressure means and for turning said upper frame means about said pivot axis during a load-depositing operation also during expansion of each fluid-pressure means, and releasable holding means operatively connected between part of said connecting means and said lower frame means for releasably holding said pivot axis stationary during turning of said upper frame means about said pivot axis when carrying out a load-depositing operation.

4,049,144

LIQUID DISPENSING APPARATUS

Lloyd J. Schimke, Box 1272, Highway 2 East, Minot, N. Dak. 58701

Filed Mar. 17, 1976, Ser. No. 667,878
Int. Cl.[2] G01F *11/38*
U.S. Cl. 222—448 **10 Claims**



6. In combination with a measuring device of the type having a body defining a measuring chamber with a cylindrical outlet located at the top of said chamber and a cylindrical inlet located at the bottom of said chamber, and means for selectively sealing each of said cylindrical outlet and cylindrical inlet while the other remains open, wherein said means are actuated by the action of a handle pivotally attached to said body, the improvement comprising:

a. flexible, cylindrical sleeve member having an exterior surface and a tubular inner surface, the length of said sleeve member being at least as great as the interior diameter of said sleeve member, said sleeve member having first and second end portions, the interior surface of said first end portion being sealably abuttable against said liquid container inserted therein; and

b. means for connecting said second end portion of said flexible sleeve member to said cylindrical inlet of said measuring chamber, said means for connecting said second end portion of said flexible sleeve member to said cylindrial inlet of said measuring chamber comprising a base member connected to said second end portion of said sleeve member, said base member defining an opening to permit the passage of liquid therethrough, said base member including a threaded portion for threadably engaging a measuring device; and a flange positioned between said sleeve member and said threaded portion of said base member and abuttable against said cylindrical inlet of said measuring chamber for forming a seal between said measuring device and said adapter.

4,049,145

REVERSIBLE AND VARIABLE SPEED DRIVE MEANS FOR CONVEYORS AND BEATERS ON A FORAGE WAGON

James H. Downing, Mineral, and Harold F. Bear, Timberville, both of Va., assignors to Bear Industries, Inc., Alexandria, Va.

Filed Mar. 26, 1976, Ser. No. 670,917
Int. Cl.[2] B60P *1/38*
U.S. Cl. 214—519 **2 Claims**

1. A self-unloading argicultural wagon comprising:

a frame having a frame front wall and having an enclosure, the frame having forward and aft ends;

an unloading assembly on the forward end of the frame;

the unloading assembly including side walls and forward and rear walls;

a power input shaft journaled between the forward and front walls and adapted to be driven by the power take-off output shaft of a prime mover for the wagon;

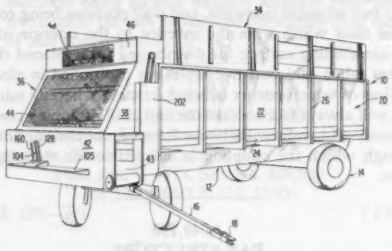
a pair of end axles journaled between said forward and rear walls of the unloading assembly and carrying sprockets;

a driven gear fixed to one of said axles;

an endless unload conveyor trained about said axles and having chain means engaged by said sprockets;

a reversible direction drive for said unload conveyor disposed between said frame front wall and said unloading assembly rear wall, and comprising a drive gear, a tension gear, and an idler gear, all aligned with said driven gear, and a chain extending transversely of the wagon and changeably trained about the drive gear and idler gear to vary the direction of rotation of the tension and driven gears and thereby change the direction of movement of the conveyor;

a variable speed drive disposed between said frame front wall and said unloading assembly rear wall and comprising drive means connecting the drive gear and the power input shaft, an adjustable first main drive pulley on said power input shaft, a variable diameter pulley on a floor web drive shaft journaled between the forward and front walls, and a belt extending transversely of the wagon and connecting said main drive and variable diameter pulleys;



an elongated pipe drive disposed above said reversible and variable speed drive and rotatably journaled between the side walls of the unloading assembly, said pipe drive being connected to said floor web drive shaft; and

endless floor webs disposed above said unload conveyor within said enclosure and driven forwardly by said pipe drive to deliver material in the enclosure to said unload conveyor.

4,049,146

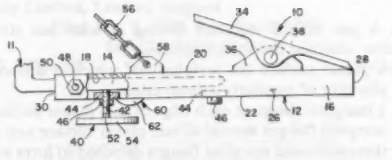
FIFTH WHEEL ATTACHMENT

Karl Decker, Lenape Way, Box 144, Ironia, N.J. 07845

Filed May 24, 1976, Ser. No. 689,353

Int. Cl.[2] B62D *53/08;* **B66F** *9/12*

U.S. Cl. 214—620 **3 Claims**



1. A portable, self-contained fifth wheel device for detachable mounting on a vehicle, such as a fork lift truck or the like, for towing a wheeled container, such as a trailer, comprising:

a. a frame for detachable connection on a wheeled vehicle of the type having a pair of spaced apart support arms, said frame having a pair of spaced apart, oppositely disposed housings with a front end and a rear end and including elongated hollow channels for receiving a corresponding pair of support arms therein from said rear end;

b. said frame including an upper surface and a lower surface with a fifth wheel pivotally mounted to said upper surface of said frame for detachable connection to a wheeled container;

c. locking means supported by said frame for selective engagement with said support arms when disposed in said housing channels, each of said channels includes members secured thereto in confronting relation to a respective one of said arms for clamping said support arms therebetween;

d. said locking means further includes:

i. a first threaded socket extending into the hollow channel on each of said housing along the lower surface thereof,

ii. a second threaded socket extending into said hollow channel on each of said housing on a plane transversely of each said first threaded socket, and

iii. a threaded member extending through each of said threaded sockets into the housing for engagement with the arms of the fork lift truck and having a screw lock handle externally of said frame for locking said frame in place relative to the arms of the fork lift truck;

e. releasing means mounted on said frame for controlling air brakes on the wheeled container, said means including:

i. an air tank mounted between said housings and comprising a pressure gauge mounted thereon with an air tank fill valve,

ii. at least one air hose connected to said air tank at one end thereof and adapted to be connected to the wheeled container, and

iii. valve means connected between said air tank and said air hose and operable from the fork lift truck for regulating said valve for selectively controlling the air flow;

f. anchor means secured to each of said oppositely disposed housings to extend above said upper surface;

g. safety ties secured at one end to said anchor means and the opposite end adapted to be secured to the fork lift truck or the like, said safety ties include spaced apart chains secured to each of said anchor means; and

h. spacing means extending rearwardly from said air tank to said valve means in the direction of the fork lift truck or the like, so as to prevent the wheeled container from accidentally engaging said air hose, said spacing means extending beyond said rear end.

4,049,147

PLASTIC SKIN ENVELOPES FOR GLASS BOTTLES AND THE LIKE

Claude J. Stiles, Tuscola, and Daniel Tomo, Arthur, both of Ill., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 433,169, Jan. 14, 1974. This application Feb. 7, 1977, Ser. No. 766,114

Int. Cl.[2] B65D *11/16, 23/08*

U.S. Cl. 215—12 R **8 Claims**

1. A seamless, lightweight, strong, uniform, multiply, oriented foamed layer tubular preform laminate with good opacity adapted to heat-shrunk onto a tubular substrate rapidly and uniformly, said laminate comprising first and second plies of plastic material in overlying adherent relation, said first ply comprising a low density polyethylene and said second ply comprising an expanded ethylene polymer, the ply of low density polyethylene being about 10–20% of the thickness of the laminate, the skrinkage along the length of said preform upon application of heat being about 70–90% and the shrinkage in the transverse direction being about 5–15%.

2. The tubular preform laminate of claim **1** wherein the expanded ply is disposed interiorly of said preform.

5. A glass bottle having an adherent coating of the tubular preform laminate of claim **2** heat shrunk thereon.

4,049,148

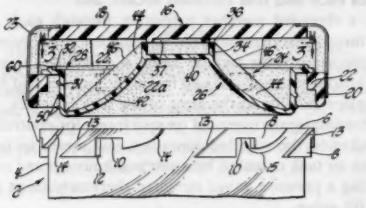
CHILD RESISTANT CLOSURE ASSEMBLY

Donald C. Suhr, Farmington Hills, Mich., and Peter Hedgewick, Windsor, Canada, assignors to International Tools (1973) Ltd., Windsor, Canada

Continuation-in-part of Ser. No. 687,740, May 19, 1976, abandoned. This application Nov. 5, 1976, Ser. No. 739,172

Int. Cl.[2] B65D *53/00, 55/02*

U.S. Cl. 215—214 **21 Claims**



1. A safety closure assembly comprising: a cap having an end wall with a skirt projecting therefrom and a plurality of peripherally spaced bayonet locking elements formed on the inner surface of the skirt adapted to be engaged with and disengaged from complementary container bayonet locking elements on a container by combined axial and rotary motion of the cap relative to such container, and a combined spring and sealing member for sealingly engaging a container to which the cap is adapted to be applied and at the same time biasing the cap locking elements into locked engagement with the container locking elements, wherein the improvement comprises the spring and sealing member having a unitary plastic body with a cylindrical sealing wall having inner and outer ends for sealingly engaging the inner wall of the mouth of a container; a flange projecting radially outwardly from the outer end of said cylindrical sealing wall for overlying the container rim; a plunger having a base portion concentric with said cylindrical sealing wall and a side wall extending between said base portion and the inner end of said cylindrical sealing wall; and a plurality of radial stiffening members extending between said base portion and the inner end of said cylindrical sealing wall for applying radially outward sealing forces on said cylindrical sealing wall in response to flexure of the side wall of said plunger in response to movement of the base portion thereof toward the inner end of said cylindrical sealing wall.

4,049,149

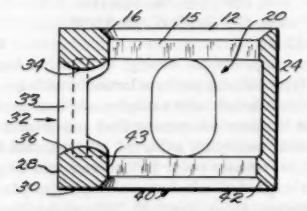
FREIGHT CONTAINER UNIVERSAL CORNER

Peter Durenec, Annandale, Va., assignor to William Brener, Annandale; Edward Ball and Floyd Branan, both of Bailey's Crossroads, all of Va., a part interest to each

Filed Nov. 24, 1975, Ser. No. 634,744

Int. Cl.[2] B65J *1/02;* **B65D** *21/02*

U.S. Cl. 220—1.5 **8 Claims**



1. An improved corner coupling for forming each corner of a shipping container comprising: a substantially rectangular block having a top wall, a bottom wall and four sidewalls defining around a hollow interior area, one of said four sidewalls being a rear wall, a second of said four sidewalls being a front wall positioned opposite said rear wall, a third of said sidewalls being an interior wall and the fourth of said sidewalls being an exterior wall positioned opposite from said interior sidewall, two adjacent ones of said four sidewalls being solid, said rear wall being one of said solid walls and said interior wall being the other solid wall, the other two adjacent ones of said four sidewalls including means defining an opening therein extending therethrough, said front wall being one of said sidewalls having an opening therein and said exterior wall being the other sidewall having an opening therein, means defining generally rectangular openings extending through said top and bottom walls leading therethrough into the hollow interior of said block, said openings in said top and bottom walls being substantially identical and in axial alignment, wall portions defining upper and lower edges of said openings within the other two adjacent sidewalls, said wall portions being rounded across their width from the exterior to the interior so as to provide a lifting surface for distributing loads placed thereon so that when said corner coupling is positioned in place, regardless of which corner is being formed, whereby said front wall will always face toward the end of the shipping container and said solid walls will always form two of the interior walls through which the coupling is secured to the shipping container.

4,049,150

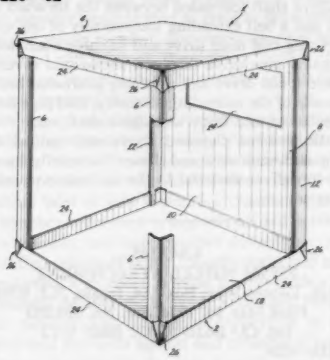
PAN STRUCTURE

Adam D. Goettl, 4960 E. Palomino Road, Phoenix, Ariz. 85018

Filed Jan. 30, 1975, Ser. No. 545,428

Int. Cl.[2] B65D *7/42, 5/24*

U.S. Cl. 220—62 **13 Claims**



1. A pan shaped sturcture having at least one structural member attached thereto comprising:

a. a planar surface the periphery of which is defined by a plurality of angularly related edges;

b. a marginal flange at each edge of said planar surface, said marginal flanges normal to said planar surface and unitary therewith, said marginal flanges disposed to form an angular corner junction between each of said marginal flanges;

c. a plurality of corner tab means unitary with said planar surface and said marginal flanges with a different one of said corner tab means located at each of the angular corner junctions, each of said corner tab means folded diagonally toward its respective one of the corner junctions and angularly toward the ones of said marginal flanges which form that corner junction; and

d. at least one structural member normal to said planar surface, said structural member having a portion thereof interlockingly interposed between at least one of said corner tab means and the ones of said marginal flanges which form that corner junction, said structural member comprising,

an elongated corner post having a pair of angularly related

surfaces with that angular relationship being substantially equal to the angular relationship of said angular corner junctions,

said elongated corner post having a slot formed in one end thereof which extends longitudinally along the junction between the pair of angularly related surfaces, and

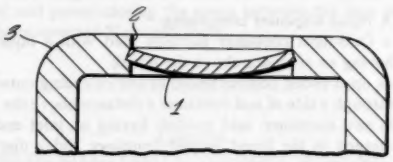
said elongated corner post having a cutout formed in the end of each of the pair of angularly related surfaces, each of the cutouts forming a relatively short tab in its respective one of the pair of angularly related surfaces with those tabs being laterally adjacent the slot of said corner post and on opposite sides thereof, the cutouts also forming a flap member in their respective ones of the pair of angularly related surfaces with those flap members being located laterally adjacent their respective ones of the tabs and spaced outwardly from the slot of said corner post.

4,049,151

METAL EXPANSION PLUG

Robert J. Schweiso, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 4, 1973, Ser. No. 320,930
Int. Cl.² B65D *51/12, 55/00*
U.S. Cl. 220—201 **7 Claims**



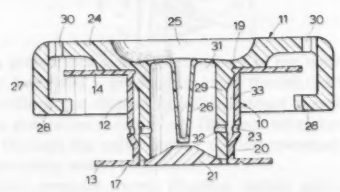
1. A heat recoverable metal plug, which has been deformed from a heat-stable configuration into a heat-unstable configuration, having a transverse dimension smaller in its heat-unstable condition than in its heat-stable condition, said plug being capable of changing its transverse dimension upon being heated to above the transition temperature at which it recovers to its heat-stable condition from its heat-unstable condition, said plug is heat unstable in its martensitic state and heat-stable in its austenitic state.

4,049,152

CLOSURE CAPS FOR VESSELS

Eugene Joseph Treanor, Burnham-on-Sea, England, assignor to Makap Limited, London, England

Filed Jan. 9, 1976, Ser. No. 647,933
Int. Cl.² B65D *51/16*
U.S. Cl. 220—209 **13 Claims**



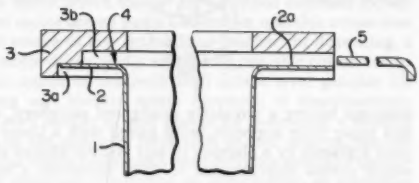
1. A closure cap for insertion into an opening in a vessel, comprising an attachment component with attachment means operative to enable the cap to be releasably secured in the opening and a sealing component separately formed from the attachment component, said sealing component being of a flexible and resilient plastics material formed as a unitary whole and comprising a support and including an inner seal integral with said support for engagement with an inner seating around the opening and an outer seal integral with said support for engagement with an outer seating around the opening, at least one of said seals comprising an outwardly directed flange integrally supported at its inner edge by the support and capable of yielding resiliently when it engages its associated seating so that the flange is urged towards the seating due at least in part to the innate resilience of the material, said closure cap having a duct leading from a space inwardly of the inner seal and communicating with a space outward of at least the inner seal, and a valve for closing the duct and comprising a valve member integral with the sealing component and openable in use in response to a pressure differential across the valve, the higher pressure being in the duct.

4,049,153

SLIDING CLOSURE ARRANGEMENT

Konrad Elsasser, Kalckreuthweg 5, D-7000, Stuttgart 1, Germany

Filed May 3, 1976, Ser. No. 682,345
Claims priority, application Germany, May 3, 1975, 2519847
Int. Cl.² B65D *43/20*
U.S. Cl. 220—345 **13 Claims**



1. A packaging arrangement which includes a container means for accommodating a material to be packaged and cover means for selectively sealing and unsealing an opening of the container means, characterized in that the container means includes a radially extending connecting flange means disposed about the opening thereof, a frame means is arranged at the opening of the container means, said frame means includes a first recess means arranged above the opening of said container means when said frame means is secured thereto and a second recess means arranged at a position below said first recess means, said second recess means having a greater radial width than said first recess means so as to define a shoulder extending over at least a portion of the frame means above said connecting flange means, said frame means being secured to the container at least between said shoulder and an upper surface of said connecting flange means, means are provided in said frame means for accommodating and retaining said cover means therein including a continuous groove means provided in said frame means, said groove means including means for permitting insertion of said cover means therein, said first recess means and an upper portion of said container means defining said groove means and said means for permitting insertion of the cover means.

4,049,154

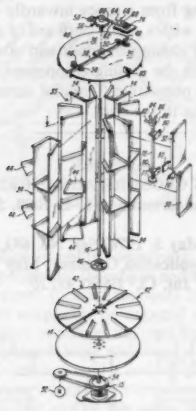
VENDING MACHINE WITH TIERED TURN TABLE CONSTRUCTION

Howard L. Burks, Dunedin, Fla., assignor to Perino B. Wingfield, Yellow Springs, Ohio, a part interest

Filed Mar. 8, 1976, Ser. No. 664,747
Int. Cl.² B65G *1/06*
U.S. Cl. 221—76 **14 Claims**

1. For use in a vending or like machine, a tiered turntable type structure providing receptacles for articles to be vended or dispensed comprising upper and lower plates spaced apart by channel shaped elements providing vertically orienting channels the sides of which are bridged by means providing horizontal partitions dividing said channels into a vertical

series of said receptacles, said channel shaped elements being circularly spaced, at least in part, and the vertical spaces thereby provided between said upper and lower plates and between adjacent of said channel shaped elements which are circularly spaced being similarly bridged by horizontal partition means to form an additional vertical series of receptacles, said upper and lower plates being each comprised of a plurality of plate segments the mating of which produces a composite



structure having a circularly configured periphery, each of said upper plate segments being paired with a lower of said plate segments by a plurality of said channel shaped elements which extend therebetween to form therewith a separable section of said tiered turntable structure, said structure being made up of mating separable sections each comprising plural vertical series of receptacles and each being formed by an upper and a lower plate segment and a plurality of interconnecting channel shaped elements.

4,049,155

APPARATUS FOR ASSEMBLING SLIDERS TO SLIDE FASTENER CHAIN

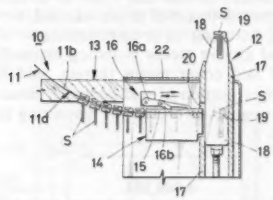
Koichi Kawakami, Kurobe, and Tatsuo Osaki, Uozu, both of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Apr. 4, 1974, Ser. No. 457,785

Claims priority, application Japan, Apr. 18, 1973, 48-46258[U]

Int. Cl.[2] B21D *53/52*

U.S. Cl. 221—192 **4 Claims**



1. A slider-applying apparatus for manually applying a slider to a fastener chain previously attached to a garment or the like, which comprises a supply chute having spaced parallel rails for delivery of sliders therebetween, a chute support having a horizontal track connected to one end of said chute, a vertically movable slider holder located adjacent said chute support and adapted to receive one slider from said chute and releasably retain said slider at a time for assembling said slider on a fastener chain previously attached to a garment or the like, and a working table having a cutaway recess at its front end behind said slider holder directly over said chute support, said recess being open to said front end and subdivided by said chute support into symmetrical halves positioned to allow a portion of the garment to depend on each side of each slider holder.

4,049,156

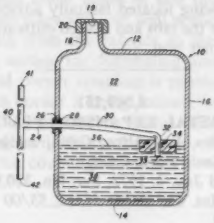
THERMALLY-RESPONSIVE LIQUID DISPENSER

Charles B. Hood, Columbus, Ohio, assignor to Chardon Laboratories, Inc., Columbus, Ohio

Filed Sept. 4, 1975, Ser. No. 610,114

Int. Cl.[2] B65D *83/14*

U.S. Cl. 222—54 **4 Claims**



1. A liquid dispenser comprising:

a. a fluid-tight container partially filed with a liquid and having an air space above the liquid;

b. an open-ended conduit sealed to and extending outwardly through a side of said container a distance above the liquid in said container, said conduit having an inlet end submerged in the liquid in said container and a discharge outlet disposed exteriorly of said container and below the level of liquid therein; and

c. a vent connected with said conduit exteriorly of said container and at a level above the liquid in said container for venting said conduit to the atmosphere surrounding said container.

4,049,157

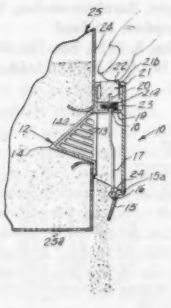
POUR SPOUT CONSTRUCTION

Eunice Carson, 9910 S. Clyde Ave., Chicago, Ill. 60617

Filed Dec. 31, 1975, Ser. No. 645,706

Int. Cl.[2] B07B *7/26*

U.S. Cl. 222—81 **10 Claims**



3. A pouring spout including an upstanding elongated hollow body, a hollow outwardly tapering prong carried by and projecting outwardly from one side of said body, said one side of said body having an opening formed therein communicating the interiors of said prong and body for rapid flow of granular material from within the interior of said prong into the interior of said body, the lower end of said body defining a downwardly opening discharge opening, closure means shiftably

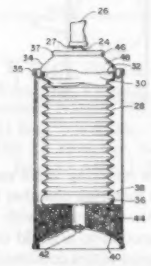
supported from said body and rapidly movable into and out of positions closing and opening the discharge opening, said prong including side walls extending outwardly from said body and converging toward a pointed outer end of said prong, at least one of said prong side walls having at least one opening formed therethrough, spring means operably connected between said body and closure means yieldingly biasing the latter toward its closed position, and operator means shiftably supported from said body for back and forth oscillating movement relative thereto between active and inactive positions and readily engageable from the exterior of said body, connecting means operatively connected between said closure means and said operator means for movement of said closure means between its open and closed positions upon shifting of said operator means between its active and inactive positions, respectively, said connecting means including an elongated longitudinally reciprocal rod extending lengthwise in said body, connected at its lower end to said closure means, and connected at its upper end to said operator means, wherein said prong is generally in the form of a three-sided pyramid, at least two sides thereof having at least one opening formed therethrough, wherein said two sides of said pyramidal prong are defined by the sets of corresponding legs of a plurality of inverted V-shaped teeth spaced along said prong and progressively increasing in size outwardly from said body, the third side of said prong closing the space between the legs of the outermost inverted V-shaped tooth.

4,049,158

PRESSURIZED CONTAINER-DISPENSERS AND FILLING METHOD

Vincent Lo; Kenneth D. Vos, and Germane M. Suchla, all of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Nov. 13, 1975, Ser. No. 631,772
Int. Cl.[2] B65D *35/28, 83/14*
U.S. Cl. 222—95 **37 Claims**



1. In a pressurized container-dispenser of the type having a container body and a product chamber therein, valve means for controlling the dispensing of a product therefrom and means to pressurize the product chamber whereby to expel product through the valve means, the improvement wherein said pressurizing means comprises:

a separate pressure source chamber within said container body;

a gas-adsorbent solid and a gas adsorbable thereon within said source chamber to provide a gas reserve whereby pressure in said source chamber is substantially reinforced despite a decrease in gas/volume in the source chamber; and

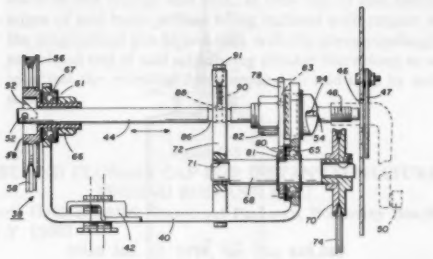
means to transmit pressure of the source chamber to the product chamber.

4,049,159

HAND DRIVE FOR BLENDING-TYPE GASOLINE DISPENSER

John Arnold Todd, and George Edward Chevallier, both of Salisbury, Md., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 4, 1976, Ser. No. 729,062
Int. Cl.[2] B67D *5/60*; F16H *37/06*; B60L *5/40*
U.S. Cl. 222—144.5 **7 Claims**



1. In a motor driven blender-type gasoline dispenser including a first motor driven pump adapted for operable connection to a first source of low octane level gasoline for dispensing, a second motor driven pump adapted for operable connection to a second source of relatively high octane level gasoline for dispensing and blender means operative to simultaneously actuate both motors of said pumps for dispensing a blended mixture of the gasolines from each of said sources, the improvement which comprises a hand drive for manually operating said dispenser comprising in combination an operating shaft mounted for hand driven rotation, drive means drive connected individually with each of said pumps and selection means presettable to selectively connect said drive means with said operating shaft for optionally actuating said first pump alone, said second pump alone or said first and second pumps simultaneously.

4,049,160

FLEXIBLE SQUEEZE DISPENSER FOR LIQUID SEALANT

Arnold Rumm, 63 Purdon Drive, Downsview, Ontario, Canada

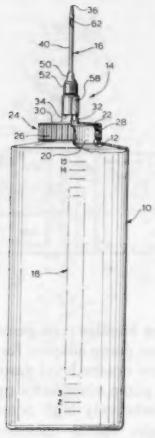
Filed Sept. 8, 1975, Ser. No. 611,578
Int. Cl.[2] B65D *37/00, 35/38*
U.S. Cl. 222—215 **5 Claims**

1. A liquid sealant dispenser for use with inflatable balls, each including means defining a closable opening in the ball, the dispenser comprising:

a resiliently deformable container for said sealant, said container having a neck which defines an opening communicating with the interior of the container; and,

a cap assembly comrpising: a cap fitted to the neck of the container, said cap and container neck being formed with co-operating means for removably retaining the cap on the container; a slender elongate dispensing element of tubular form which projects from said cap and which has an inner end portion communicating with the interior of the container, and an outer end which is outwardly rounded, said inner end portion of the dispensing element including an outwardly directed flange, and said cap including an outwardly projecting tubular formation receiving and surrounding said flange; and a sleeve crimped around said formation at the position of said flange and coupling said formation in liquid-tight relationship with said flange; the dispensing element being formed with a single, laterally-directed dispensing opening which communicates with the interior of the container, said opening being of a length not substantially greater than its width and being positioned closely adjacent to but spaced from the outer end of the element so that the portion of the

dispensing element between said opening and the cap is of substantial length compared with the overall length of the element and is unapertured, said portion of the element being of constant cross-sectional shape and having a small external diameter in relation to the overall length of the element to allow insertion of the element in said closable opening in a ball;



whereby when the dispensing element is inserted through said opening in a ball, said unapertured portion of the dispensing element extends through the wall of the ball and spaces said dispensing opening of the element substantially inwardly of the ball so that the element communicates only with the interior of the ball, whereupon the container can be deformed to dispense sealant into the ball.

4,049,161

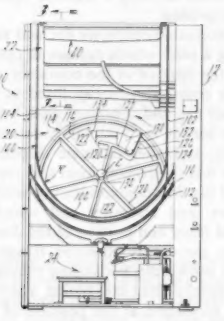
ICE MAKING AND VENDING MACHINE

Vance L. Kohl, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.

Continuation of Ser. No. 437,468, Jan. 28, 1974, abandoned. This application Nov. 7, 1975, Ser. No. 630,045

Int. Cl.² F25C *1/04*

U.S. Cl. 222—233 **8 Claims**



1. In an ice cube vending machine,

a housing including an ice cube dispensing area,

ice storage bin means within said housing and providing an ice cube storage area for ice cubes to be dispensed at said dispensing area,

means providing an ice transfer path between said storage and dispensing areas,

a rotatable ice transfer drum means within said storage area for selectively conveying ice cubes toward said transfer path, a first electrically energized motor means for selectively rotating said drum,

a pivotally mounted shutter element located adjacent said path and movable between a first position substantially out of registry with said path thereby permitting relatively unobstructed movement of ice along said path, and a second position substantially in registry with said path so as to at least limit movement of ice along said path,

a second electrically energized motor means operatively connected to said shutter element for causing selective pivotal movement of said element, and

control means for operating said first motor means independently of said second motor means in a first mode of operation of said machine and for operating both said first and said second motor means in a second mode of operation of said machine.

4,049,162

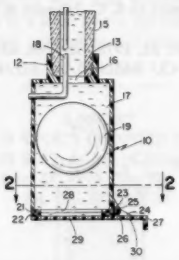
METERING VALVE

Lance S. Yule, P.O. Box 324, Ogunquit, Maine 03907

Filed Mar. 5, 1976, Ser. No. 664,318

Int. Cl.² B65D *47/00*

U.S. Cl. 222—476 **5 Claims**



1. A liquid dispenser metering valve comprising:

a housing defining a metering chamber therein, a liquid inlet communicating therethrough with said chamber and adapted for connection to a liquid container adjacent its opening, and a liquid outlet communicating therethrough with said chamber;

a ball in said chamber floatable in liquid to be dispensed therefrom;

a valve seat for said ball at said outlet, defining an aperture having a diameter smaller than that of said ball;

a cover pivotally connected to said housing adjacent said outlet adapted to open and close said aperture;

biasing means connected to said cover biasing said cover to a normally closed position;

lever means connected to said cover and extending therefrom beyond the pivotal connection thereof to said housing, adapted for actuation to open said cover; and

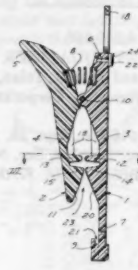
a vent tube having an opening at each end, extending from said housing through said inlet and having a length sufficient to place one end adjacent the bottom of said liquid container, said tube also extending through said housing for establishing a vent to atmosphere at its other end.

4,049,163

CLOTHES-HANGING CLIP

Gerhard Stolz, Hanfelderstrasse 317, 8130 Starnberg, Germany

Filed July 19, 1976, Ser. No. 706,213
Int. Cl.[2] A47J 51/14
U.S. Cl. 223—96 **10 Claims**



1. A clothes-hanging clip commprising:
a main part having an upper portion and a lower portion;
means for securing said main part on a vertical surface with said upper portion above said lower portion;
a pivotal part having an upper portion and a lower portion respectively adjacent the upper and lower portions of said main part;
a pivot having a horizontal pivot axis between said portions and interconnecting said parts, whereby said pivotal part can pivot about said axis relative to said main part;
a spring braced between said parts and urging said lower portions toward each other;
a horizontally extending ridge on each of said lower portions formed with a central seam-receiving notch and engageable against the corresponding ridge of the other lower portion;
and a flat surface on each of said lower portions below the respective ridge inclined downwardly away from the other lower portion and forming with the flat surface of the other lower portion a downwardly widening V-shaped throat.

4,049,164

BACK FRAME

John L. Sullivan, Fort Erie, Canada; Veronica A. Knauber, Lancaster, and James E. Nelson, Williamsville, both of N.Y., assignors to A-T-O Inc., Willoughby, Ohio

Filed July 21, 1976, Ser. No. 707,232
Int. Cl.[2] A45F 3/00
U.S. Cl. 224—5 W **12 Claims**

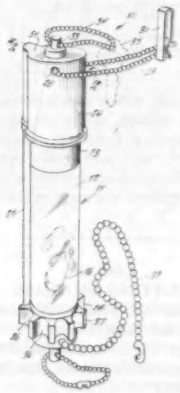
1. An improved back frame for use in a life support breathing system supplying regulated breathing air to a user thereof wherein said system includes a tank of compressed breathing air supported on the back of a user by said back frame, a face mask and regulated air hose means, said latter means being intermediately disposed in fluid connection with said tank of compressed breathing air and said face mask, said improved back frame comprising:
a body portion adapted for placement on the back of a user and harness means for so securing said body portion thereon, and a retaining strap operable to releasably retain said tank of compressed air on the side of said back frame body portion outward of the user's back, each of the ends of said retaining strap being secured to a corresponding lateral edge of said body portion so as to at least partially encircle and engage said tank, at least one of said lateral edges of said body portion being inclined with respect to the longitudinal axis of said tank with the correspondingly associated end of said strap being slidable therealong so as to adjust the retention force applied to said tank by said strap.

4,049,165

CASE AND CLOSURE CAP FOR INSTANT MINIATURE FISHING ROD AND REEL

Morris Goldhaft, 8100 Shorefront Parkway, Rockaway Beach, N.Y. 11693

Filed Jan. 12, 1976, Ser. No. 648,647
Int. Cl.[2] A45F 5/00
U.S. Cl. 224—5 E **7 Claims**



1. In a key holder for instant fishing, the combination of a cylindrical case consisting of a transparent tube having upper and lower end caps screw threaded to upper and lower ends of said tube, a quantity of water in said case and conventional fishing hooks, lures, and keyring fish hooks which are interchangeable, floating on the water; a bracket mounted upon said upper end cap supporting a reel of fishing line and a miniature fishing rod, said bracket having a pair of aligned openings which align with a D-shaped opening formed through a sideward projecting tab of said upper end cap, all three said openings being fitted with friction sleeves which frictionally grasp said fishing rod which is cross-sectionally D-shaped, said fishing rod being slidable between a retracted position alongside said case and an extended upward position, and means coupled to at least one of said end caps for holding keys.

4,049,166

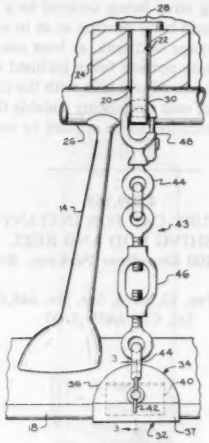
CLAMP APPARATUS

William K. Medlin, 2406 Victoria Ave., Ann Arbor, Mich. 48104

Filed May 10, 1976, Ser. No. 684,732
Int. Cl.[2] B60R 11/00
U.S. Cl. 224—42.1 G **5 Claims**

1. Apparatus for securing an inverted boat with integral oarlock, or similar receptacles on the roof of a motor vehicle, said apparatus comprising a bolt for positioning in and extending downwardly from one of said receptacles, said bolt having

an enlarged head at one end for supporting said bolt in said receptacle and an eyelet opening at the other end, a clamp assembly for detachably fastening to said motor vehicle, and extensible and contractible coupling means extending between and connected to said bolt and said clamp assembly, said clamp assembly including a member having an upright portion con-



nected to said coupling means and a transverse portion for engaging said motor vehicle, said extensible and contractible coupling means including fastening means releasably connected to said bolt through said eyelet opening and a turnbuckle device operable when contracted to draw said bolt and said clamp assembly toward one another thereby to secure said boat on said roof.

4,049,167

CUTTING OF GLASS

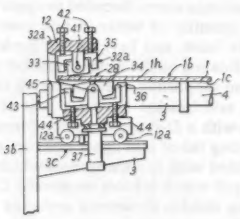
Jean Guissard, Courbevoie, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Apr. 22, 1975, Ser. No. 570,554

Claims priority, application France, Apr. 25, 1974, 74.14357; Mar. 19, 1975, 75.08513

Int. Cl.[2] C03B *33/02*

U.S. Cl. 225—2 **8 Claims**



1. An automatic method of recovering glass of good quality from a longitudinal glass ribbon having a central part of good quality and edge portions of inferior quality which comprises the steps of:

scoring merely a line of cut on a first surface of the ribbon between the central part and the edge portion,

hammering a second surface of the glass along a path opposite the score line to initiate breakage, the glass being subject to pressure exerted on both surfaces at points facing each other and at the point where the glass is hammered,

bending the glass by lifting the central part of the glass adjacent the score line and rebating the edge portions to bring the surfaces of the central portion and said edge portion to predetermined angular positions to complete breakage,

dividing the ribbon to give a sheet of the required length, and

removing the edge portion from the central portion.

4,049,168

TENSION EQUALIZER

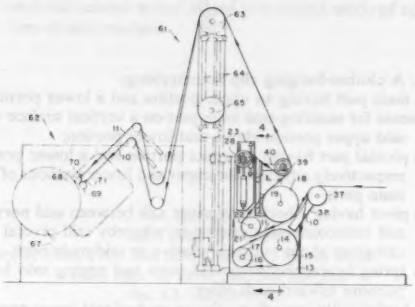
Leon J. Cole, Lima, Ohio, and John R. Tolan, South Bend, Ind., assignors to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 616,156, Sept. 24, 1975, abandoned.

This application Dec. 27, 1976, Ser. No. 754,763

Int. Cl.[2] B65H *59/38, 77/00*

U.S. Cl. 226—40 **3 Claims**



1. Apparatus for coordinating the transfer of a first cord and a second cord comprising:

a frame;

a first roll means, mounted on said frame, over which said first cord may be passed;

a second roll means, mounted on said frame, over which said second cord may be passed;

a first drive means, mounted on said frame, for driving said first roll means;

a second drive means, mounted on said frame, for driving said second roll means; and

control means, operably associated with said second roll means, for varying the speed of said second roll means in response to variations in the tension of said first cord.

4,049,169

CRESCENT SILENCING RESET MECHANISM FOR FAST FORWARD 8-TRACK CARTRIDGE

Robert Henry Houf, Jr., Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 25, 1976, Ser. No. 661,227

Int. Cl.[2] B65H *17/22*

U.S. Cl. 226—47 **10 Claims**

1. An interlock mechanism for a cartridge tape player comprising;

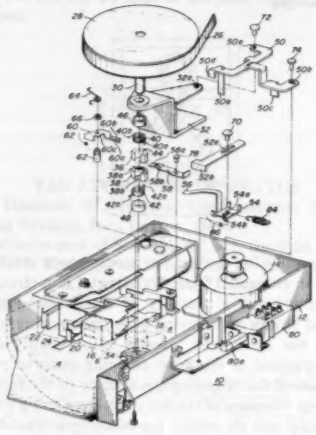
a cylindrical capstan rotatably driven about its longitudinal axis by a motor actuated flywheel, the longitudinal axis being located in a vertical plane and predeterminedly positioned to forcibly engage the tape and pressure roller of a tape cartridge to be played;

a plurality of crescents vertically stacked on, and rotatable about, the capstan, each crescent having an inner face, an outer face and a vertical dimension, the inner face encircling greater than 180° of the capstan circumference while revealing a substantial arc on the capstan surface, the outer face of predetermined curvature, the vertical height predeterminedly fixed;

first means coupling the uppermost crescent to the capstan for rotation therewith in a first mode;

means coupling each crescent to the crescent beneath it in the first mode, including means aligning the crescents such that the outer faces form a substantially circular configuration as viewed from a point above the axis of the capstan;

means decoupling the uppermost crescent from the capstan in a second mode and indexing the uppermost crescent such that it reveals the capstan to the pressure roller; and



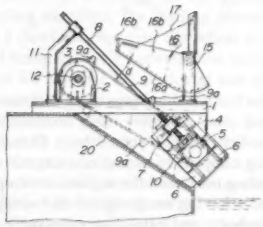
second means coupling rotational drive of the capstan to the lowermost crescent actively driving it to index at a position such that it exposes the capstan to the pressure roller when the player is activated from the first to the second mode, the second means comprising means for disengaging the lowermost crescent upon activation to the first mode and forcibly engaging the lowermost crescent on activation to the second mode.

4,049,170

DEVICE FOR PULLING UP AND PAYING OUT AN OIL BOOM

Hiroshi Kawakami, Kamakura; Isao Nagaoka, and Yukio Tsukagawa, both of Yokohama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Apr. 23, 1976, Ser. No. 679,613
Claims priority, application Japan, May 1, 1975, 50-52008
Int. Cl.[2] B65H *17/34*
U.S. Cl. 226—74 **4 Claims**



1. A device for pulling up and paying out an oil boom formed by a plurality of longitudinally spaced floats fixed to at least one side of a continuous flexible skirt at certain equally spaced predetermined intervals, said device comprising:

a structural frame,

a pair of end pulleys journaled to said frame for rotation about substantially horizontal axes at positions spaced from each other,

an endless belt engaging said end pulleys and having on its outer surface a plurality of float engaging projections for said oil boom,

a pusher member mounted in juxtaposition to said structural frame overlying and facing the projection on a surface of the endless belt,

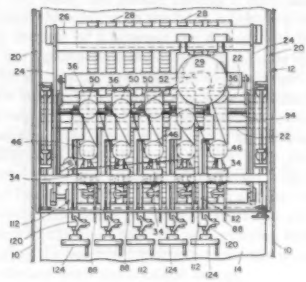
means for resiliently supporting said pusher member at a given distance relative to said endless belt and wherein said engaging projections are arranged on said endless belt at intervals substantially equal to the intervals between said float on said oil boom.

4,049,171

ADJUSTABLE ROLL SLICING SYSTEM

Dale S. Lecrone, 4447 Bonnymede, Jackson, Mich. 49201

Filed Sept. 16, 1976, Ser. No. 723,919
The portion of the term of this patent subsequent to Oct. 14, 1992, has been disclaimed.
Int. Cl.[2] B26D *3/28*
U.S. Cl. 225—94 **12 Claims**



7. A machine for slicing rolls between the tops and bottoms thereof while arranged in clusters of a predetermined number of separably adjoined rolls by cutting into one side of the rolls in such clusters along but spaced from a longitudinal joint between adjacent rolls in said clusters, said machine comprising:

a. a cutter head frame having side members and a plurality of parallel guide rods extending horizontally between said side members to comprise a rigid frame,

b. a conveyor beneath said guide rods and parallel thereto and supported for movement in a direction to support and feed clusters of rolls in a feeding direction parallel to said side members and transverse to said rods,

c. a plurality of bearing blocks supported upon said rods and respectively and rotatably supporting spindle shafts extending perpendicularly above said conveyor and provided with circular disc knives on the ends thereof nearest said conveyor,

d. power means operable to rotate said spindle shafts and knives simultaneously to slice rolls in clusters as the same are moved past said knives by said conveyor,

e. an elongated arm connected to and projecting forwardly from each of said bearing blocks and provided with a supporting shaft, roll breaking units pivotally supported respectively by said elongated arms upon said supporting shafts thereon forwardly of said spindle shafts in said bearing blocks relative to the direction of feed of said rolls by said conveyor, said breaking units being in longitudinal alignment with said spindle shafts for said knives and mounted for operation immediately above the plane in which said knives rotate and operable to break apart pairs of rolls along the joints therebetween above the slice made in each roll by said knives to provide a clearance for

passage of said spindle shafts of said knives between said pairs of rolls incident to said rolls being sliced from end to end, and

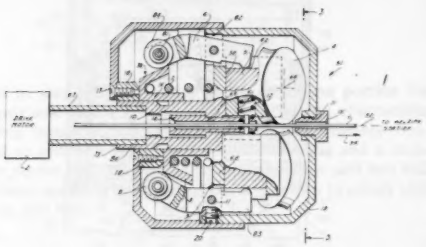
f. roll breaking units each comprising a pair of rotatable shafts mounted within bearings in supplemental blocks supported upon said supporting shafts in said elongated arms, means normally urging said supplemental blocks and rotatable shafts of said units toward said operative positions thereof relative to said knives, and tension spring means connected to said supplemental blocks of said units and operable to move the same toward the inoperative positions and hold the same in said inoperative positions.

4,049,172

PLANETARY WIRE-FEEDING MECHANISM FOR ELECTRIC ARC-WELDING APPLICATIONS

David Albert Samokovliski; Petko Kostadinov Grozdanov; Alfred Emmerich Nemechek; Peter Dimitrov Petrov, and Simeon Georgiev Punchev, all of Sofia, Bulgaria, assignors to Institute po Zavaryavane, Sofia, Bulgaria

Filed Sept. 24, 1976, Ser. No. 726,412
Claims priority, application Bulgaria, Sept. 24, 1975, 31062
Int. Cl.[2] B65H *17/22*
U.S. Cl. 226—90 **4 Claims**



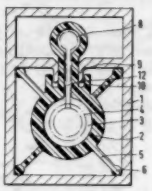
1. In an apparatus for converting the rotational force of a motor shaft to a prescribed linear force along a first axis for selectively advancing an elongated wire along the first axis, a substantially cylindrical hollow feed housing coaxial with the first axis and through which the wire may be advanced in a forward direction along the first axis, the housing having a radial flange intermediate its ends and a rear portion projecting axially rearwardly from the flange, the outer surface of the rear housing portion being threaded at a rear end thereof, first and second pistons supported in a forward portion of the housing on generally opposite sides of the first axis for radial reciprocation toward and away from the first axis, first and second rollers rotatably carried by the respective first and second pistons for planetary rotation about the first axis during a rotation of the housing, the first and second rollers respectively having axes that are skewed with respect to the first axis to cooperate when in an innermost radial position to engage the wire and to advance the wire along the first axis when the first and second rollers are rotated, a conical guide member supported for slidable axial movement on the outer surface of the rear housing portion, an adjustment nut disposed in threaded engagement with the rear end of the rear housing portion, a calibrated spring extending between the flange and the front end of the conical guide member to normally urge such member toward the adjustment nut, first and second levers individually pivoted in the housing intermediate their respective ends on generally opposite sides of the first axis, the first and second levers extending longitudinally in the housing, corresponding first ends of the levers terminating opposite the conical guide member and corresponding second ends of the lever terminating opposite the radially outer ends of the respective first and second pistons, resilient means coupled to each piston for urging the outer end of the piston against the opposed second end of the associated lever, means disposed at the first end of each lever for coupling such first end to the opposed portion of the conical guide member, and means for fixedly connecting the motor shaft to the rear housing portion.

4,049,173

BAR STOCK FEEDING DEVICE

Laurentino Gomez-Alecha, Mondragon, Spain, assignor to Alacoop S. Coop., Mondragon, Spain

Filed May 5, 1976, Ser. No. 683,374
Claims priority, application Spain, June 17, 1975, 213217
Int. Cl.[2] B65H *23/04*
U.S. Cl. 226—196 **5 Claims**



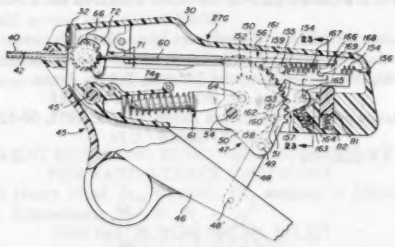
1. An assembly for feeding bar stock into a machine tool, comprising an elongated feeder housing of non-circular internal cross-section and a plurality of blocks disposed in said housing, said blocks each having a central aperture to slidably receive the bar stock, and a series of outwardly extending portions comprised of vibration damping material positioned and dimensioned for engaging the interior of the feeder housing to prevent vibration of the bar stock from being transmitted to the housing and to render the block non-rotatable in the housing.

4,049,174

TAG ATTACHING APPARATUS

Paul H. Hamisch, Sr., Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 571,342, April 24, 1975, Pat. No. 3,971,497. This application Mar. 25, 1976, Ser. No. 670,204
Int. Cl.[2] B25C *1/00*
U.S. Cl. 227—67 **8 Claims**



1. Apparatus for attaching tags using fasteners, the fasteners being arranged in an assembly, each fastener including a bar section and a head section joined by a filament section, the fasteners being coupled to a common carrier member by respective coupling members, the apparatus comprising: a body, a hollow needle having an elongated slot along one side supported by the body and extending outwardly of the body, a push rod supported by the body for driving a bar section of a fastener through the needle while a filament section of the fastener extends through the slot, means engageable with the coupling members for feeding the fastener assembly to bring the bar sections one-at-a-time along a path into alignment with the push rod, means for severing the bar sections from the respective coupling members, the feeding means including a

toothed wheel, a pawl for engaging the wheel to advance the wheel, the pawl being movable between first and second positions, and means for moving the push rod and the pawl in a sequence in which the push rod is moved to effect severing of the bar section by the severing means and to effect movement of the bar section through the needle while the respective filament section passes along the slot and in which the pawl is thereafter moved to advance the toothed wheel, and a latch controlled by the moving means and mounted by the body to prevent the pawl from advancing the toothed wheel until after the push rod has moved clear of the path of movement of the bar sections.

4,049,175

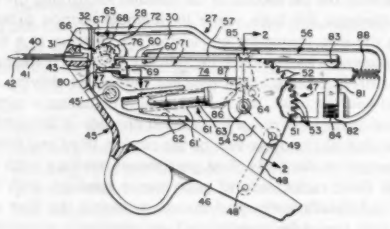
TAG ATTACHING APPARATUS

Paul H. Hamisch, Sr., Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 571,342, April 24, 1975, Pat. No. 3,971,497. This application Mar. 25, 1976, Ser. No. 670,205

Int. Cl.[2] B25C *1/00*

U.S. Cl. 227—67 **3 Claims**



1. Apparatus for attaching tags using fasteners, the fasteners being arranged in an assembly, each fastener including a bar section and a head section joined by a filament section, the fasteners being coupled to a common carrier member by respective coupling members, the apparatus comprising: a body, a hollow needle having an elongated slot along one side supported by the body and extending outwardly of the body, a push rod supported by the body for driving a bar section of a fastener through the needle while a filament section of the fastener extends through the slot, means engageable with the coupling members for feeding the fastener assembly to bring the bar sections one-at-a-time along a path into alignment with the push rod, means for severing the bar sections from the respective coupling members, the feeding means including a toothed wheel, a pawl for engaging the wheel to advance the wheel, the pawl being movable between first and second positions, and means for moving the push rod and the pawl in a sequence, the moving means including a slide having rack teeth, a gear segment in mesh with the rack teeth, the gear having a groove with spaced apart abutment faces, a projection received in the groove, a link connected to the pawl and to the projection, a manually operable actuator coupled to the gear segment, the projection cooperating with one abutment face upon manual actuation of the actuator to move the pawl from the first position to the second position, means for returning the push rod, the slide, the gear segment, and the actuator to their initial positions, the projection being cooperable with the other abutment face after the push rod has moved clear of the path of movement of the bar sections for moving the pawl from the second position to the first position to effect advance of the toothed wheel.

4,049,176

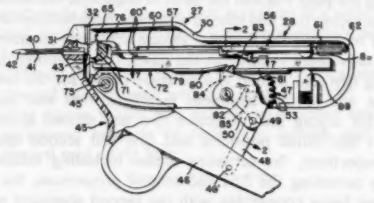
TAG ATTACHING APPARATUS

William A. Jenkins, Englewood, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed May 11, 1976, Ser. No. 685,245

Int. Cl.[2] B25C *1/00*

U.S. Cl. 227—67 **16 Claims**



1. Apparatus for attaching tags using an assembly of fasteners, each fastener including a bar section and a button section joined by a filament section, a runner and a connector individual to each fastener connecting the respective bar section to the runner, the apparatus comprising: a body, a needle mounted by the body, the needle having a bore and an elongated slot communicating with the bore, a push rod engageable with the bar section of a fastener for driving the bar section through the bore while its filament section extends through the slot, means for advancing one fastener at a time into alignment with the bore including a rotatably mounted toothed wheel, a pawl for driving the toothed wheel, and means for driving the push rod and the pawl, means providing an annular bearing surface disposed adjacent to and coaxial with the toothed wheel, the pawl including a first arm in contact with the means providing the bearing surface and a second arm having a tooth cooperable with the toothed wheel, at least one of the arms being flexible and resilient, the first arm exerting force on the means providing the bearing surface to cause the tooth to be in cooperable contact with the toothed wheel.

4,049,177

TAG ATTACHING APPARATUS

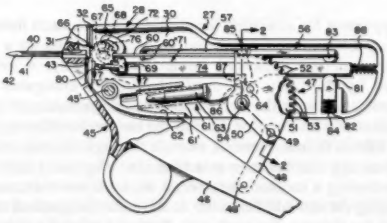
Charles B. Bussard, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 571,345, April 24, 1975, Pat. No. 3,971,498. This application July 8, 1976, Ser. No. 703,321

The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.

Int. Cl.[2] B25C *1/00*

U.S. Cl. 227—67 **2 Claims**



1. Apparatus for attaching tags using fasteners, the fasteners being arranged in an assembly, each fastener including a bar section and a head section joined by a filament section, the fasteners being coupled to a common carrier member by respective coupling members, the apparatus comprising: a body, a hollow needle having an elongated slot along one side supported by the body and extending outwardly of the body, a push rod supported by the body for driving a bar section of a fastener through the needle with a filament section of the

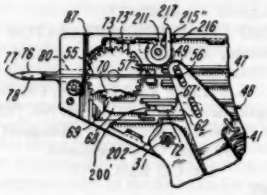
fastener extending through the slot, means engageable with the coupling members to feed the fastener assembly so that one bar section of one fastener at a time can be brought into position to be pushed through the needle by the push rod, the feeding means including a toothed wheel, a pawl for engaging successive teeth of the wheel to advance the wheel, the pawl being movable between first and second positions, and means for actuating the push rod and the pawl in sequence, the actuating means including first and second abutment members, means for movably mounting the first and second abutment members on and for movement relative to the pawl, the mounting means including first and second spaced-apart pivots for the respective first and second abutment members, first and second springs for urging the respective first and second abutment members into initial positions, and first and second spaced-apart projections, the actuating means including means for movably mounting the first and second projections, the first projection being cooperable with the second abutment member to move the second abutment member out of the way against the action of the second spring so that the first projection can cooperate with the first abutment member to drive the pawl from the first position to the second position and the second projection being cooperable with the first abutment member to move the first abutment member out of the way against the action of the first spring so that the second projection can cooperate with the second abutment member to cause the feed wheel to feed the fastener assembly, the first and second springs being effective to return the respective first and second abutment members to their initial positions.

4,049,178

TAG ATTACHER

Larry D. Strausburg, Miamisburg, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 587,745, June 17, 1975, Pat. No. 3,973,710. This application May 12, 1976, Ser. No. 683,101
Int. Cl.² B25C *5/06*
U.S. Cl. 227—67 **4 Claims**



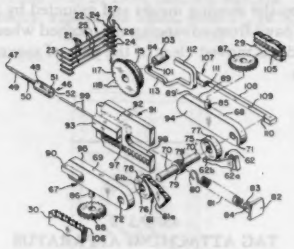
1. Apparatus for attaching tags using fasteners, each fastener including a bar section and a button section joined by a filament section, the apparatus comprising: a body, a needle mounted by the body, the needle having an elongated slot communicating with the bore, a push rod engageable with the bar section of a fastener for driving the bar section through the bore while its filament section extends through the slot, means for advancing one fastener at a time into alignment with the bore including a toothed member, a movable member, means for driving the movable member to advance the toothed member and for driving the push rod, first and second guides secured to the body for guiding the movable member, the movable member including a flexible resilient first arm in slidable contact with the first guide, a second arm in slidable contact with the second guide, a flexible resilient third arm having a tooth cooperable with the toothed member, the first guide being cooperable with the first arm to urge the tooth into contact with the toothed member and to urge the second arm into contact with the second guide, both the first and third arms being yieldable as the pawl tooth moves relative to the toothed member.

4,049,179

TAG ATTACHING APPARATUS

William A. Jenkins, Englewood, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed May 11, 1976, Ser. No. 685,244
Int. Cl.² B25C *1/00*
U.S. Cl. 227—67 **31 Claims**



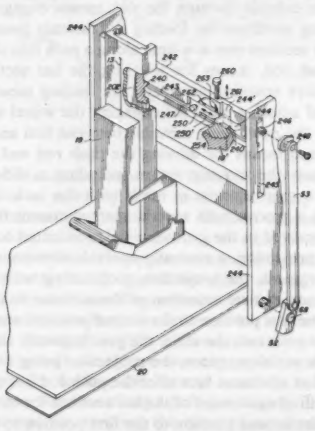
1. Apparatus for attaching tags using fasteners, each fastener including a bar section and a button section joined by a filament section, and apparatus comprising: a body, a needle mounted by the body and having an elongated bore and an elongated slot communicating with the bore, a push rod engageable with the bar section of the fastener for driving the bar section through the bore while its filament section extends through the slot, means for advancing one fastener at a time into alignment with the bore including a toothed member, a pawl for driving the toothed member, means for driving the push rod and the pawl, the driving means including a carrier connected to the push rod, a first rack at one side of the carrier, a second rack at the other side of the carrier, third and fourth racks secured to the body, first gear means meshing with the first and third racks, second gear means meshing with the second and fourth racks, and means mounting the first and second gear means for translational and rotational movement.

4,049,180

STITCHING HEAD BYPASS APPARATUS

Jonathan E. Hause, Canandaigua, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 24, 1976, Ser. No. 689,319
Int. Cl.² B27F *7/18*
U.S. Cl. 227—78 **2 Claims**



1. In an apparatus for fastening an assemblage of sheets

together to form a pack using one more fasteners, the combination of:

a. at least two fastening heads for driving fasteners through said sheets to form said pack, each of said heads including

1. a drive ram supported for reciprocable movement toward and away from said sheet assemblage to drive said fasteners through said sheet assemblage whereby to form said pack, and

2. anvil means opposite said ram for receipt of said sheet assemblage therebetween, said anvil means cooperating with said ram to clench the portions of said fastener protruding through said sheet assemblage whereby to prevent withdrawal of said fastener and disassembly of said pack; and

b. drive means for reciprocating said ram, at least one of said drive means including

1. a reciprocable driver plate,

2. an interposer for drivingly coupling said driver plate to said ram,

3. means supporting said interposer for movement between a first position where said interposer drivingly couples said driver plate with said ram and a second position where said driver plate is not coupled with said ram, and

4. lock means for selectively retaining said interposer in either of said first or second positions,

means supporting said driver plate for reciprocable driving movement,

a slot-like driving recess in said driver plate adjacent each of said stitching heads and including an enlarged portion,

said drive ram including a projecting tang member disposed in said enlarged portion of said driving recess

said interposer being disposed in said driving recess for selective movement between said first position to engage said tang member with said driver plate and drive said one stitching head and said second position wherein said interposer is withdrawn from between said driver plate and said tang member whereby engagement of said tang member with said driver plate is prevented.

4,049,181

AUTOMATIC NAILING MACHINE

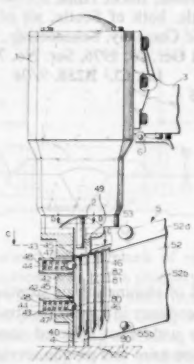
Shigemasa Kametaki, 7225-5 Shingu, Shingu, Wakayama, Japan

Filed June 15, 1976, Ser. No. 696,315

Claims priority, application Japan, Dec. 4, 1975, 50-144866; Mar. 22, 1976, 51-31538

Int. Cl.² B25C *1/00*

U.S. Cl. 227—113 **2 Claims**



1. In an automatic nail driving device having a guide hole through which the nail to be driven is driven, a reciprocal compressed air piston rod means at the top of said guide hole above said nail for driving said nail downward, and a magazine means at the side of said guide hole for supplying nails to said guide hole, the improvement comprising:

a magnetic attraction means positioned on the side of said guide hole opposite said magazine at a right angle to said guide hole and resiliently projecting into said guide hole for attracting said nails in said magazine, said attraction means comprised of:

at least one cylindrical member fitted through the wall of said guide hole opposite said magazine at a right angle to said guide hole and having an opening into said guide hole,

a spherical permanent magnet in said cylindrical member at the end thereof open into said guide hole, and

biasing means within said cylindrical member against said permanent magnet for resiliently forcing said magnet toward said guide hole.

4,049,182

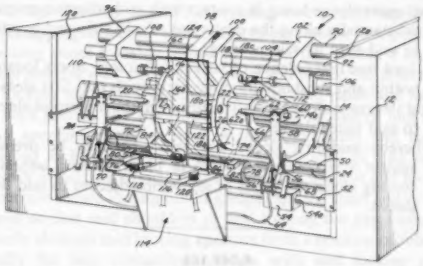
INERTIA WELDING INDEXING SYSTEM

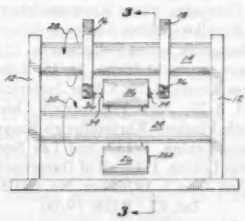
Johan August Louw, Orange, and Robert Earle Ghiselin, Costa Mesa, both of Calif., assignors to Textron Inc., Santa Ana, Calif.

Filed Feb. 19, 1974, Ser. No. 443,233

Int. Cl.² B23K *19/02*

U.S. Cl. 228—2 **9 Claims**





1. Friction welding apparatus comprising in combination,

a transfer wheel having three workpiece retainers and being rotatable about a first axis to move said retainers sequentially from a load station to a weld station to an ejection station and back to the load station,

at least three motors each of which is adapted with at least on workpiece holder,

mounting means for said motors to rotate the same about a second axis sequentially from a load station to at least one speed station to a weld station and back to the load station,

and motive power means operatively connected to said transfer wheel and to said mounting means to simultaneously move said retainers and motors from one to another of their respective stations, each of said motors being moved from its speed station to its weld station while one of said retainers is moved from its load station to its weld station, whereby each of said motors is afforded

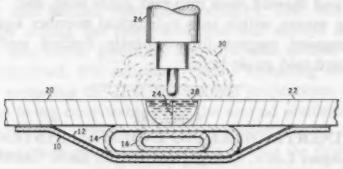
time between its load and weld stations to attain predetermined speed.

4,049,183

WELDING BACK-UP TAPE

William A. Roden, Rancho Santa Fe, and Glenn L. Criger, San Diego, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed May 24, 1976, Ser. No. 689,416
Int. Cl.[2] B23K *9/02*
U.S. Cl. 228—50 **14 Claims**



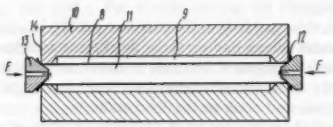
1. A welding back-up tape comprising:
an elongated narrow thin strip of flexible flat material;
an adhesive coating on one surface of said strip;
an outer tubular sleeve of woven refractory fibers;
said outer sleeve being in contact with said adhesive coating substantially along the centerline of said strip and bonded to said strip by said coating; and
at least one inner sleeve of woven refractory fibers located within and substantially concentric with said first sleeve;
said sleeves increasing in diameter from the innermost sleeve to said outer sleeve;
whereby said first sleeve and said strip may be pressed against a structure and held in place by said adhesive coating along the edges of said strip adjacent to said first sleeve.

4,049,184

METHOD OF MANUFACTURING POLYMETALLIC PIPES

Jury Iosifovich Rozengart, ulitsa Fuchika 14, kv. 11; Viktor Yakovlevich Ostrenko, ulitsa Komsomolskaya, 65/44; Efim Abramovich Reznikov, ulitsa Simferopolskaya, 19/10; Izrail Moishevich Sukonnik, ulitsa Poligonnaya, 22/16; Oleg Georgievich Fedorov, prospekt Ilicha, 21/15; Robert Georgievich Kheifets, ulitsa Kirova, 8/29; Viktor Jurievich Untilov, ulitsa Kazakova, 11 8/29; Jury Viktorovich Chichkov, prospekt Kirova, 48a/45; Vladimir Khrisanfovich Kasyan, ulitsa Naberezhnaya imeni Lenina, 1/132, and Lev Semenovich Lyakhovetsky, ulitsa Lenina, 1/12, all of Dnepropetrovsk, U.S.S.R.

Filed June 7, 1976, Ser. No. 693,554
Int. Cl.[2] B23K *19/00*
U.S. Cl. 228—131 **9 Claims**



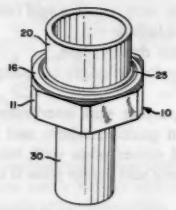
1. A method of manufacturing polymetallic pipes consisting of preparing the contacting surfaces of pipe billets for producing a diffusion joint between them; inserting said pipe billets coaxially into one another; sealing off the gap between said pipe billets at the ends of said billets thus forming a multilayer pipe billet; heating said multilayer pipe billet and placing it in a die; sealing off the space of said multilayer pipe billet; filling said space of said multilayer pipe billet with a fluid medium for building up pressure inside said space; creating a temperature gradient in the body of said multi-layer pipe billet so that the temperature at at least one end of said billet is lower than it is in the other parts of said billet; and selecting a pressure sufficient for making a diffusion joint between said contacting surfaces of said pipe billets.

4,049,185

METHOD OF FORMING DOUBLE EXTRUDED MOUNT

Russell A. Nippert, Delaware, Ohio, assignor to The Nippert Company, Delaware, Ohio

Filed Mar. 11, 1977, Ser. No. 776,709
Int. Cl.[2] B23K *31/00*; H01L *21/48*
U.S. Cl. 228—155 **3 Claims**



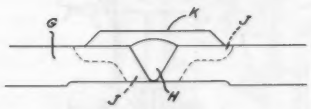
1. The method of forming a mount for a solid state rectifier and the like which comprises
a. forming a hexagonal shaped billet of high conductivity copper,
b. brazing a steel ring on the upper surface of said billet,
c. brazing a steel tube in position within said ring on the upper surface of said billet,
d. cold-forming said billet in a first extrusion step to provide a recess in the upper face of said billet of the same diameter as the inner diameter of said tube and concurrently generating a weld-projection on the upper surface of said ring,
e. and additionally cold-forming said billet in a second extrusion step to form a downwardly projecting stem thereon (and to additionally shape said weld projection), said first and second extrusion steps causing work-hardening of said brazed joints and of the copper of said billet.

4,049,186

PROCESS FOR REDUCING STRESS CORROSION IN A WELD BY APPLYING AN OVERLAY WELD

Rodney E. Hanneman, Burnt Hills; Richard M. Chrenko, and Donald B. Kittle, both of Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 20, 1976, Ser. No. 734,323
Int. Cl.[2] B23K *9/04*
U.S. Cl. 228—225 **5 Claims**



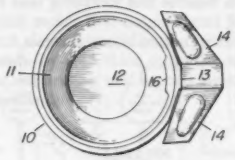
1. The method of eliminating or substantially reducing the stress corrosion tendency in a weld constraint zone terminating within a primary weld heat affected zone of a butt welded austenitic steel pipe joint in a pipe in service in a nuclear reactor which comprises the step of applying to the outside of the pipe a secondary or overlay weld extending across the pipe joint and bridging on each side of the pipe joint beyond the axial extremities of the primary weld heat affected zone at the inner surface of the pipe.

4,049,187

THERMOFORMED HOT DRINK CUP

John Florian, Bakersfield, Calif., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 511,144, Oct. 2, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 661,209
Int. Cl.² B65D *1/26, 23/10*
U.S. Cl. 229—1.5 B 7 Claims



1. A nestable thermoformed cup and handle means formed integrally therewith in such fashion as to not interfere with nesting of stacked cups and to form a stable handle upon movement of the handle means to operative position comprising:

a. a cup body having an upper brim portion, a bottom of smaller dimension than said brim portion and sides tapering inwardly from said brim portion to said smaller bottom;

b. a tab integral with the upper edge of said brim portion extending outwardly therefrom and normal thereto; and

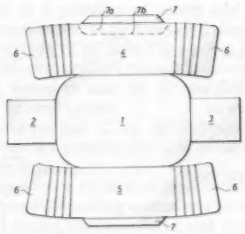
c. a flange integrally hinged to each side of said tab and having an inner edge adjacent to and free of the brim portion, said inner edge being immediately adjacent the brim at its point of attachment to the tab and shaped to conform to the inwardly tapering side of cup body so that when the flanges are folded downwardly substantially the entire length of each inner edge will contact the side of the cup body to provide an elongated bearing surface against the body.

4,049,188

PACKAGE

Lennart Gerhard Persson, Bjarred, Sweden, assignor to AB Akerlund & Rausing, Lund, Sweden

Filed Nov. 8, 1976, Ser. No. 739,451
Claims priority, application Sweden, Nov. 13, 1975, 7512727
Int. Cl.² B65D *5/56, 21/02*
U.S. Cl. 229—14 BL 5 Claims



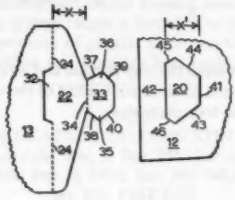
1. A package formed from a blank of rigid material, said blank including a bottom wall and a plurality of side walls and extension members extending outwardly from portions of said side walls, a lining of plastic material lining the internal walls of said package, said internal lining extending over the top edge of said side walls, said lining further extending along a portion of the exterior of the side walls of said package and along said extension members to define an exterior lining, said exterior lining further including a free edge defining a flange extending in a direction outwardly from the side walls of the package, said extension members reinforcing said flange and being operable to act as a stop for one part of the package and said flange being operable to act as a stop for another part of the package and engage a portion of another package nested therewith to prevent said nested packages from being wedged within each other.

4,049,189

PANEL INTERLOCKING MEANS AND METHOD

Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 542,913, Jan. 22, 1975, abandoned. This application Feb. 25, 1976, Ser. No. 661,057
Int. Cl.² B65D *5/02*
U.S. Cl. 229—48 R 11 Claims



1. Interlocking means for securing two panels together in overlapping relation, said interlocking means comprising a locking panel foldably joined to one of the panels, a locking heel integral with said locking panel and projecting therefrom, a locking toe foldably joined to said locking panel and having a neck portion and outwardly projecting shoulders, and locking aperture means formed in the other panel and having spaced locking edges one of which is at least as long as the width of said neck portion of said locking toe and said locking aperture means having holding edges spaced apart and configured so that said shoulders of said locking toe can swing directly through said locking aperture from a position of substantially flat face contacting relation with said locking panel without deformation of said locking toe in such manner that the shoulders of said locking toe are interlocked with parts of the other panel adjacent said holding edges and adjacent said one locking edge and so that said locking heel is adjacent the other of said locking edges due to the angular disposition of said locking toe relative to said other panel which is maintained by the inherent bias exerted on said locking toe at said neck portion tending to urge said locking toe into engagement with said one of said locking edges so that a tension force at said neck portion resists any tendency of said locking toe to slip out of said locking aperture whereby said locking heel is retained within said aperture means and in engagement with the other of said locking edges thereby to prevent substantial relative movement between the panels.

4,049,190

MAILING AND STORAGE BOX

James L. O'Neill, Norfolk, Mass., assignor to Merkert Enterprises, Inc., Canton, Mass.

Filed Nov. 26, 1976, Ser. No. 744,953
Int. Cl.² B65D *5/54*
U.S. Cl. 206—611 22 Claims

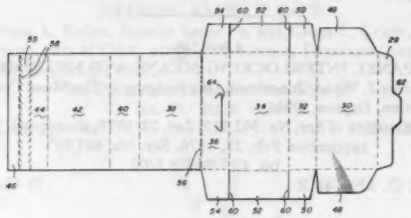
1. A blank for a container comprising:

a tray portion including a series of serially connected flaps and panels including, in sequence a lid front flap, a lid panel, a rear panel, a tray panel and a tray front flap, each of said panels having end flaps extending therefrom at opposite ends thereof, said flaps and panels being foldable to define an end-loadable, top-opening box configuration;

said blank further including a wrapper extension extending from and defining a continuation of the tray portion, said wrapper extension including, serially, a wrapper top

panel, a wrapper rear panel, a wrapper bottom panel and a wrapper front panel;

at least one of said wrapper panels having a tear-strip formed therein; and



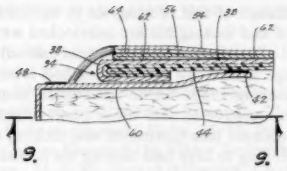
the juncture between the tray portion and wrapper extension being weakened to facilitate tearing of the wrapper extension from the tray portion.

4,049,191

BLOCK BOTTOM VALVE BAG

Robert J. Stearley, Des Moines, Iowa, assignor to Great Plains Bag Corporation, Des Moines, Iowa

Filed Feb. 2, 1976, Ser. No. 654,567
Int. Cl.[2] B65D *31/14*
U.S. Cl. 229—62.5 **8 Claims**



1. A block bottom bag comprising:

a front wall, a back wall, and opposite end walls forming an enclosed container, said end walls having an interior facing surface and an exterior facing surface;

at least one of said end walls having an approximately flat configuration and having a valve opening formed therein;

a valve member extending through said valve opening, said valve member comprising an elongated flexible tube collapsed into a flat configuration having an upper tube wall and a lower tube wall in facing engagement;

said valve member having a first end extending within the interior of said container and a second end extending outwardly from the exterior of said container;

said upper wall of said flexible tube being operatively secured to the interior surface of said end wall whereby upward flexing movement of said end wall causes upward flexing movement of said upper wall of said flexible tube;

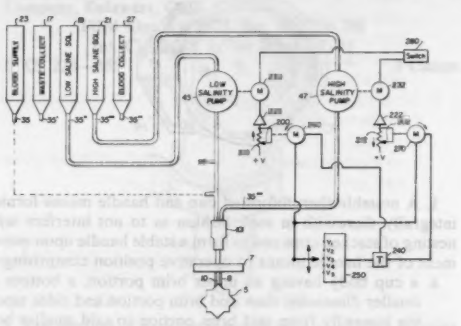
said lower wall of said flexible tube being detachably secured to the exterior facing surface of said end wall adjacent said second end of said tube so as to prevent said lower wall from moving upwardly when said upper wall is flexed upwardly.

4,049,192

BLOOD WASHING METHOD USING A SALINE WASH SOLUTION OF VARYING CONCENTRATION FOR USE WITH BLOOD WASHING APPARATUS

Daniel Fritz Krebs, Norwalk, Conn., and Hector Miranda, Yorktown Heights, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,606
Int. Cl.[2] B04B *11/02*
U.S. Cl. 233—14 R **2 Claims**



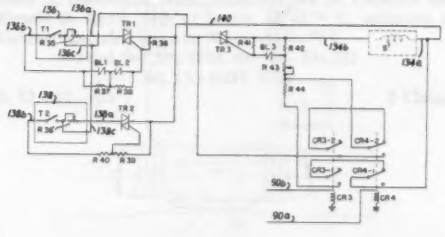
1. In a method of washing blood by providing blood in a rotatable enclosure member and thereafter introducing saline wash solution into said rotatable enclosure member to contact said blood for a pre-determined washing period and thereby remove contaminants therefrom the improvement which comprises decreasing the concentration of the introduced saline solution from an initial relatively high concentration to a predetermined lower concentration at a substantially linear rate while maintaining the flow rate of the saline solution at a constant value throughout the washing period.

4,049,193

SYSTEMS AND APPARATUS FOR CONTROL OF FUELED HEAT GENERATORS

Herbert Haviland, deceased, late of Norfolk, Conn., by Diane Haviland, administratrix, Stratford, Conn.; Arthur Smith, Ansonia, Conn., and Charles Boyer, Bronx, N.Y., assignors to Fuel Computer Corporation, Bronx, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,442
Int. Cl.[2] F23N *5/20*
U.S. Cl. 236—46 R **14 Claims**



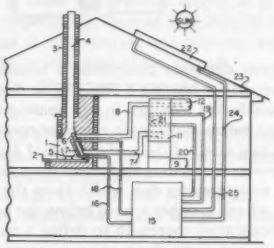
1. A system for use in operating a heat generator, comprising:

a. first circuit means for generating first and second output signals respectively upon occurrence of successive times of day;

b. second circuit means for generating successive pairs of first and second output signals, each such signal pair defining a preselected time period following occurrence of said first circuit means first output signal and before occurrence of said first circuit means second output signal;

c. third circuit means for generating a first output signal throughout each said preselected time period and for generating a second output signal upon occurrence of said first circuit means second output signal and thereafter until recurrence of said first circuit means first output signal;
d. first and second temperature-sensitive switch elements; and
e. switching means having output terminals for connection with said heat generator and settable in first state by said third circuit means first output signal for connecting said first switch element to said output terminals and settable in second state by said third circuit means second output signal for connecting said second switch element to said output terminals.

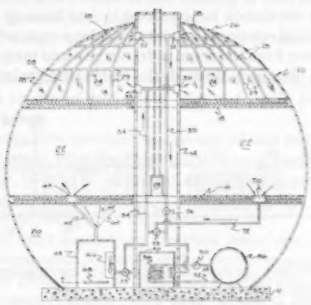
4,049,194
FIREPLACE/FORCED AIR FURNACE HEAT GENERATION AND DISTRIBUTION SYSTEM
Vernon Lawton Tice, 2 Olney Mill Court, and Donald Francis Glover, 4128 Sir Walter Road, both of Olney, Md. 20832
Filed Mar. 9, 1976, Ser. No. 665,310
Int. Cl.[2] F24B *7/00*; F24J *3/02*
U.S. Cl. 237—1 A **14 Claims**



1. A method for distributing heat energy in a fireplace to a plurality of rooms of a structure using the forced air heating of said structure comprising:
a. providing said fireplace with a heat exchange device;
b. providing a forced air heating system containing interconnected in sequence as components thereof return air conduit means, a fan air moving means, an air heating means, a plenum chamber, and distribution air conduit means whereby in operation said distribution air conduit means delivers air to a plurality of rooms and said return air conduit means removes air from said plurality of rooms;
c. driving a portion of air from the plenum chamber of said forced air heating system into said fireplace heat exchange device by means of said fan air moving means of said forced air heating system;
d. flowing said portion of air through said fireplace heat exchange unit at a positive pressure created by said fan air moving means; and
e. flowing said portion of air now in a heated condition back into said forced air heating system at a point in one of said air conduit means components of said forced air heating system.

2. An improved fireplace heat distribution system comprising:
a. a fireplace containing a heat exchange device therein;
b. a forced air heating system containing interconnected in sequence as components thereof return air conduit means, a blower fan air moving means, an air heating means, a plenum chamber, and distribution air conduit means whereby in operation said distribution air conduit means delivers air to a plurality of rooms and said return air conduit means removes air from said plurality of rooms;
c. a first opening in said fireplace heat exchange device to receive a portion of air from said forced air heating system and a second opening on said heat exchange device to remove heated air therefrom; and
d. first interconnecting conduit means for flowing air to be heated to said fireplace heat exchanger from said forced air heating system and second interconnecting conduit means for flowing heated air to said forced air heating system from said fireplace heat exchange device, each connected at one end to said first and second openings respectively of said fireplace heat exchange device with the other end of said second interconnecting conduit means connected to said forced air heating system at a point in one of said air conduit means components thereof, with said other end of said first interconnecting conduit means connected to said forced air heating system at a point in the plenum chamber of said forced air heating system whereby said fan air moving means of said forced air heating system causes a forced flow therethrough and provides pressure of greater than prevailing atmosphere pressure within said fireplace heat exchange device.

4,049,195
SOLAR HEATED BUILDING STRUCTURE
Robert W. Rugenstein, Rte. 2, Box 251, Inman, S.C. 29349
Filed Dec. 8, 1976, Ser. No. 748,637
Int. Cl.[2] F24J *3/02*
U.S. Cl. 237—1 A **17 Claims**

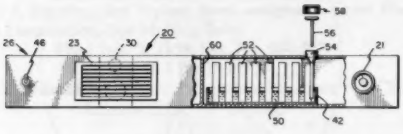


1. A solar-heated building structure comprising an exterior shell including a generally semi-spherical roof section, said roof section having exterior light-transmitting surface means for admitting passage of sunlight into said shell, horizontal floor means within said shell dividing the interior of the shell into a living compartment and an attic compartment extending between said living compartment and said roof section for the storage of air to be heated by sunlight passing through said exterior surface means of said roof section, conduit means extending through said floor means and into said attic compartment for the passage of air into said attic compartment to be heated therein and for the passage of heated air out of said attic compartment, and means in said shell communicating with said conduit means for circulating the heated air through said living compartment and for returning air from said living compartment to said conduit means for reintroduction into said attic compartment to be heated therein.

4,049,196
FIREPLACE HEATER, CIRCULATOR, AND HUMIDIFIER SYSTEM
Samuel S. Bergami, Jr., 18 King St., and Samuel S. Bergami, Sr., 192 York St., both of West Haven, Conn. 06516
Filed Mar. 8, 1976, Ser. No. 664,529
Int. Cl.[2] F24B *7/00*
U.S. Cl. 237—51 **2 Claims**

1. A heater, circulator and humidifier system for installation in conventional fireplaces comprising:

A. an enclosed air circulation chamber incorporating
  a. a forward, substantially rectangular hollow, air-conducting housing portion having a horizontal length slightly greater than the horizontal fireplace hearth opening and a vertical width substantially equal to the width of two bricks, thereby providing a housing portion which is dimensioned to be compatible with any conventional fireplace with a minimum of conspicuousness; and
  b. a substantially U-shaped in plan, hollow, air-conducting portion having forward, free open ends in air-conducting relationship with rear wall of the rectangular portion and rearwardly extending therefrom substantially perpendicularly to the rear wall of the rectangular portion;
  c. an overall substantially L-shaped configuration in a side elevation with the housing portion forming the base of the L and the U-shaped portion forming the vertical leg of the L, adapted for installation in a fireplace with the L rotated 90°, whereby the entire air circulation chamber when installed in position provides a substantially flat horizontal planar lower surface extending from the front of the fireplace to the rear thereof;
B. an inlet portal formed in said housing portion for directing air into said chamber;
C. an outlet portal formed in said housing portion for directing air circulating within said chamber out of the chamber;
D. an air circulation fan mounted in said housing portion in juxtaposed relationship with said inlet portal, whereby the air drawn from the room is drawn into said inlet portal and forced therefrom through the entire air circulation chamber, thereby providing a positive circulation pressure throughout;



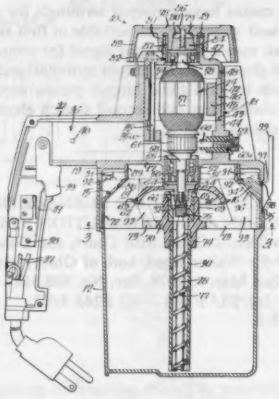
E. a humidification unit mounted within said housing portion in juxtaposed spaced relationship to said outlet portal and incorporating
  a. a water container mounted in said housing portion in juxtaposed spaced relationship to said outlet portal,
  b. a plurality of upstanding water absorbing members positioned in said water container and extending above the water level into the air flow path,
  c. a fill tube extending from an external surface of said housing portion into said water container, providing easy replacement of water into said container, and
  d. an elongated water level measuring stick cooperating with said fill tube for determining the level of water in said container;
F. mounting means for securely maintaining said system along the lower horizontal row of bricks of said fireplace defining the open hearth and comprising
  a. brackets mounted to the top surface of said rearwardly extending substantially U-shaped portion, and
  b. screw clamp assemblies
    1. threadedly engaged in said brackets for cooperative association with the rear surface of said housing portion, and
    2. incorporating wing nuts mounted on one end thereof, enhancing the ease of manual rotation of said clamping bolts into their secure position;
G. thermostat means for controlling the flow of heated air through said system depending upon the temperature thereof; and
H. switch means connected to said air circulation means for manually controlling the air circulation.

4,049,197

SPRAY DISPENSER

Frans Brouwer, Glencoe, Ill., assignor to Albert E. Sloan, Chicago, Ill.

Filed Oct. 16, 1975, Ser. No. 622,908
Int. Cl.[2] B05B 3/08
U.S. Cl. 239—218.5 **12 Claims**



1. In a spray dispenser comprising a housing, a receptacle attached thereto for holding a liquid to be dispensed in spray form, a rotatable disk mounted in said housing fo spraying said liquid, motor means including a rotor for rotating said disk, a shaft projecting axially from said rotor, said disk being fixed to said shaft, means for feeding said liquid from said receptacle to the side of said spraying disk which faces the bottom of said receptacle, a fixed member spaced below the underside of said disk and cooperating therewith to define a metering opening therebetween, and means for moving said rotor, shaft and disk axially relative to said housing to vary the size of said metering opening to regulate the volume of liquid fed to said spraying disk,

means for setting the metering opening in a predetermined position comprising a threaded collar fixed to said housing, a control cap in threaded engagement with said collar, said control cap having an inner flange with an outer surface and a tapered inner surface, a correspondingly tapered member cooperatively positioned within said inner flange, a sleeve connected to said shaft and being juxtaposed to said outer surface of said inner flange, and means for moving said tapered member axially relative to said inner flange to urge said inner flange into securing engagement with said sleeve, such that rotation of said cap in first direction moves said sleeve, shaft and disk away from said fixed member to increase the size of said metering opening and rotation of said cap in the opposite direction moves said sleeve, shaft and disk toward said fixed member to decrease the size of said metering opening.

4,049,198

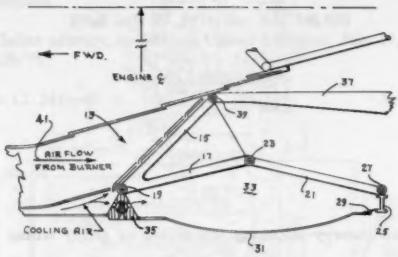
DUCT PRESSURE ACTUATED NOZZLE

John H. Maurer, Santa Clara, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 17, 1976, Ser. No. 696,963
Int. Cl.[2] B64C 15/06
U.S. Cl. 239—265.39 **4 Claims**

1. In a variable area convergent-divergent nozzle for use on an aircraft powered by a jet engine having an inner and an outer casing with a cooling air flow passage therebetween, the improvement comprising, a series of converging flaps pivotally mounted in the flow path of the engine exhaust, a corresponding series of forward pressure flaps integral with said coverg-

ing flaps, both of said series of flaps mounted for rotation about a common pivot point, an aft pressure flap pivotally mounted on the aft end of each of said forward pressure flaps and extending rearwardly therefrom, means for sealing the area outside said forward and aft pressure flaps to create a pressure cavity between the outer casing of the jet engine and the pressure flaps, the aft ends of said aft pressure flaps being pivotally



attached to said sealing means, a diverging flap pivotally mounted on the aft end of each of said converging flaps, and means for controlling the flow of cooling air into and out of the pressure cavity to cause the pressure therein to be increased and decreased, respectively, causing said integral converging and pressure flaps to move inward and outward, respectively, in response to the requirement of the aircraft.

4,049,199

NOZZLES FOR GAS TURBINE ENGINES

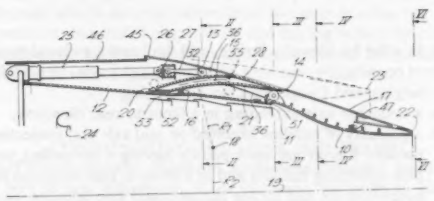
Douglas John Nightingale, Bristol, England, assignor to Rolls-Royce (1971) Limited, England

Filed Apr. 13, 1976, Ser. No. 676,411

Claims priority, application United Kingdom, May 9, 1975, 18889/75

Int. Cl.² B64C *15/02*

U.S. Cl. 239—265.39 **7 Claims**



1. A variable area nozzle for a gas turbine engine comprising fixed structure including a jet pipe, a circumferential array of nozzle petals, including certain master petals arranged about the discharge opening of the jet pipe and means supporting the petals for nozzle area varying movement relative to the jet pipe, said means including in respect of at least said master nozzle petals respective pairs of axially spaced apart rollers which engage guide track surfaces supported from said structure, there being, in respect of the upstream roller of each said pair, a radially outwardly facing guide track surface and in respect of the downstream roller of each said pair a radially inwardly facing guide track surface, the radially inwardly and outwardly facing guide track surfaces being mutually inclined for changing the relative petal inclinations on operation of means for simultaneously moving all the said petals along said guide track surfaces, there being further provided structure interconnecting the radially inwardly facing guide track surfaces whereby in operation radially outward loads from the said downstream rollers are borne at least partially by tension in said structure.

4,049,200

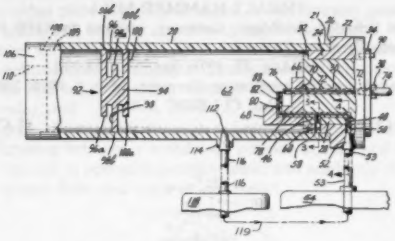
NEBULIZER

Jacob M. Sobol, 62 Tet Zayin, Zefat, Israel

Filed Apr. 5, 1976, Ser. No. 674,044

Int. Cl.² B05B *7/26*

U.S. Cl. 239—338 **7 Claims**



1. Nebulizer apparatus comprising;

an elongate housing having a chamber therein and supporting a pneumatic nozzle in aspirating relation to a liquid nozzle in said chamber;

a liquid inlet formed in said housing in fluid communication with said liquid nozzle;

a pneumatic inlet formed in said housing in fluid communication with said pneumatic nozzle;

a liquid passage between said chamber and said liquid nozzle; and

flow control means for selectively connecting said liquid nozzle to one of said liquid inlet and liquid passage and comprising;

a drum rotatably mounted at one end of said housing;

said pneumatic inlet comprising a first axial passage;

said drum having an eccentric axial passage parallel with said first axial passage and connected to a first transverse passage terminating in said liquid nozzle;

said liquid inlet comprising a second transverse passage in fluid communication with said eccentric passage; and

said liquid passage comprising a third transverse passage in fluid communication with said eccentric passage and angularly displaced from said second transverse passage.

4,049,201

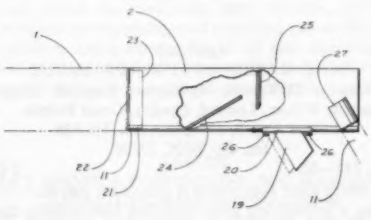
MECHANICAL SEPARATION OF SUBSTANCES

Glen MacArthur, 1659 Sweetbrier St., Palmdale, Calif. 93550

Filed Aug. 4, 1976, Ser. No. 711,546

Int. Cl.² B02C *19/12*

U.S. Cl. 241—5 **2 Claims**



1. A device for dry separation of solid particles of different weights when acted upon by the force of gravity, said device comprising a receiving chamber provided with a screen for limiting size of particles introduced into said chamber, a cylindrical passageway to receive particles from said chamber, said cylinder having a spreader plate positioned to impart a laminar flow to the particles, a strike plate to check speed of the parti-

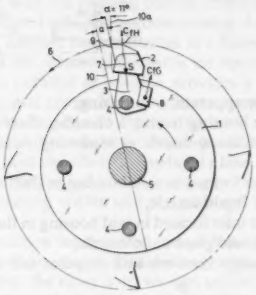
cles and break particles into smaller sizes, a screened opening to receive particles of greater weight and an outlet for discharging lighter weight particles.

4,049,202

IMPACT HAMMER MILL

Horst Schmidt, Schildgen, Germany, assignor to KHD Industrieanlagen Ag, Germany

Filed Aug. 27, 1976, Ser. No. 718,332
Claims priority, application Germany, Mar. 4, 1976, 2608883
Int. Cl.[2] B02C *13/04*
U.S. Cl. 241—30 **11 Claims**



1. An impact hammer mill apparatus comprising:

at least two hammer assemblies having arm portions and equalization masses, the hammers being arranged symmetrically about a periphery of said rotor;

each of said hammer assemblies being pivotable about a pivot axis through its respective arm and parallel to and offset from said rotor axis;

each of said hammers having a wearing head with an impact surface facing in the general direction of rotation of the rotors; and

each said equalization masses being affixed to a side of the arm portion of each of said hammers circumferentially opposite the impact surface of the head thereof and having a center of gravity behind a radial line connecting the pivot axis with the rotor axis, with respect to the direction of rotation of the rotor, whereby the impact surface of the head is maintained in an optimum impact orientation, despite wear thereof, by centrifugal forces acting upon the equalization mass and the wearing head.

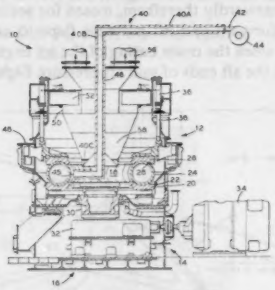
4,049,203

COAL SLURRY DRYING APPARATUS

Edwin Charles McKenzie, Wallington, England, assignor to Babcock & Wilcox, Limited, London, Great Britain

Filed Aug. 5, 1976, Ser. No. 711,925
Int. Cl.[2] B02C *23/30*
U.S. Cl. 241—52 **2 Claims**

1. A slurry drier comprising a pulverizer having a housing enclosing a pulverizing zone including horizontally disposed upper and lower grinding rings, a circular row of rotatable grinding elements positioned between the upper and lower rings, means for passing heated carrier air through the pulverizing zone, a fixed tubular walled conduit for delivering slurry to be dried and pulverized in the pulverizing zone, the conduit having a horizontally oriented outlet section surrounded by the grinding elements and discharging thereto, and a vertically oriented section connected to the outlet section and extending upwardly through the top of the housing, and wherein insulation covers the walls of the horizontally and vertically oriented



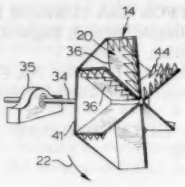
sections thereby inhibiting the drying of slurry within said conduit.

4,049,204

FAN FOR FORAGE HARVESTING SYSTEM

Russell C. McKee, Elmira, Canada, assignor to McKee Bros. Limited, Elmira, Canada

Filed Sept. 23, 1976, Ser. No. 726,012
Int. Cl.[2] B02C *23/28*
U.S. Cl. 241—55 **6 Claims**



1. In a fan for blowing forage, said fan having a closed back, a front opening for receiving said forage and a side opening for discharging said forage, said fan comprising:

a. a rotatable axle extending in a front to rear direction,

b. a plurality of paddles mounted on said axle and projecting radially therefrom, each paddle having a propelling surface extending radially and in a front to rear direction for propelling air and forage through said side opening, each propelling surface having a front edge, an opposite rear edge, and a radially outer edge,

c. a plurality of shredder blades located on each propelling surface adjacent said outer edge, each said shredder blade having a radially innermost lower end, a radially outermost trailing raised end, and a sharpened upper edge, the improvement comprising:

d. a plurality of further shredder blades located on each propelling surface, each further shredder blade having a lower front end, a trailing raised end, and a sharpened upper edge,

e. said front ends of said further shredder blades on each paddle being spaced apart in a radial direction on the said propelling surface of their associated paddle and such front ends being located adjacent said front edge of said propelling surface of their associated paddle, each further shredder blade extending in a direction both towards said back edge and radially outwardly along its associated paddle, so that forage entering said front opening of said fan will slide over said further shredder blades and will be cut thereby and so that said further shredder blades and

said shredder blades in combination will cut said forage to varied lengths.

4,049,205

HORIZONTAL, DETACHABLE, BALL MILL

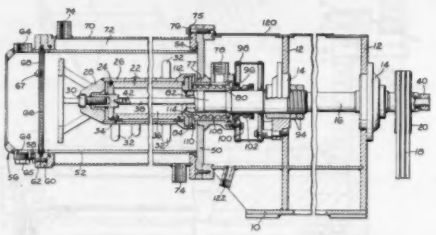
Robert William English, Stratford-on-Avon, England, assignor to The Mastermix Engineering Company Limited, Hereford, England

Filed July 23, 1976, Ser. No. 708,039

Claims priority, application United Kingdom, July 29, 1975, 31628/75

Int. Cl.² B02C *23/36*

U.S. Cl. 241—67 **3 Claims**



1. A mill comprising a shaft mounted in a pair of bearings located at one end of the shaft, and a wall having an opening through which the shaft extends, wherein the improvement comprises a horizontal-flow container for the charge, which is removably mounted at one end in cantilever fashion upon one side of said wall and has a screened outlet at its other end, a tubular inlet housing which is mounted on the other side of said wall, surrounding a portion of the shaft between said wall and said bearings, and which has a seal through which the shaft enters the inlet housing, a feed screw mounted on said portion of the shaft, another portion of the shaft, extending within the container, being of greater diameter than said opening and being closely spaced from said wall to provide a narrow gap through which material passes from the inlet housing into the container, the shaft being hollow and having means for circulating a cooling fluid therethrough, and a shroud for holding a cooling fluid in contact with the exterior of said seal.

4,049,206

COMMINUTING MACHINE FOR TRASH

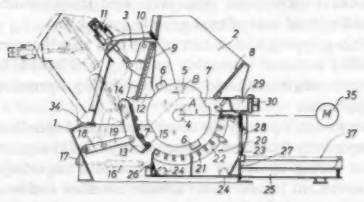
Rolf Konig, Handorf; Bernhard Nordemann, Munster, and Herbert Motek, Altenberge, all of Germany, assignors to Hazemag Dr. E. Andreas Kg, Munster, Germany

Filed Apr. 8, 1976, Ser. No. 675,052

Claims priority, application Germany, Apr. 12, 1975, 2516014

Int. Cl.² B02C *13/02*

U.S. Cl. 241—73 **11 Claims**



1. An apparatus for comminuting trash and the like, said apparatus comprising:

a generally closed housing having at its top an inlet and at its bottom an outlet;

a rotor in said housing rotatable about a horizontal axis and provided with at least one radially extending beater element;

means for rotating said rotor about said axis in a predetermined rotational sense;

an impact member in said housing generally above said axis and spaced radially from the orbit of said beater element, said inlet being upstream of said impact member relative to said sense;

a crusher plate pivotally mounted in said housing generally below and downstream of said impact member;

means for pivoting said crusher plate between an effective position spaced radially relatively close to said rotor and an ineffective position radially relatively far from said rotor; and

a grate displaceable through a hole in a sidewall of said housing between a withdrawn position outside said housing and an operative position under and relatively closely spaced from said rotor at said outlet.

4,049,207

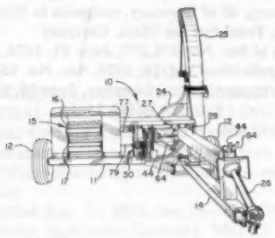
FORAGE HARVESTER DRIVE

Donald P. Storm, Hinsdale; Peter Sammarco, Downers Grove; Edward A. Fritz, Hinsdale, and Robert J. Mackert, Downers Grove, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Feb. 12, 1976, Ser. No. 657,515

Int. Cl.² B02C *18/24*

U.S. Cl. 241—101.7 **9 Claims**



1. In a forage harvester, said forage harvester including a cutterhead, drive means for said cutterhead, a feed roll mechanism including at least a pair of counter-rotating rolls for delivering crops to said cutterhead, and a feed roll drive mechanism driven from said cutterhead drive means and driving said feed rolls, the improvement wherein said feed roll drive mechanism comprises two alternative power paths for transmitting power from said cutterhead drive means to produce forward and reverse drive of said feed rolls, each of said power paths including an electromagnetic clutch operably disposed therein to control the transmission of power therethrough, a source of electrical power for energizing said clutches, and remote switch means for supplying said electrical power for alternative exclusive engagement of each of said electromagnetic clutches to shift said feed roll mechansim from forward to reverse drive while maintaining forward drive to said cutterhead.

4,049,208

CHUCK SPINDLE POSITIONING MECHANISM FOR ARMATURE WINDING MACHINE

Glen E. Bucholtz, and Hyman B. Finegold, both of Dayton, Ohio, assignors to The Globe Tool and Engineering Company, Dayton, Ohio

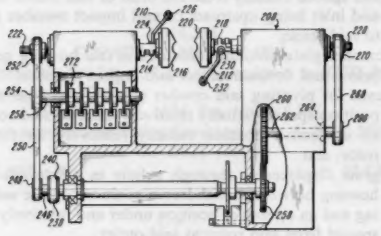
Filed Oct. 14, 1976, Ser. No. 732,541

Int. Cl.² H02K *15/04*

U.S. Cl. 242—7.05 B **5 Claims**

1. In a flier-type armature winding machine, mechanism for axially positioning a spindle rotatably driven through a spline connection and supporting a flier comprising, in combination,

a cartridge receiving said spindle, thrust transmitting bearing means journalling and axially retaining said spindle within said cartridge, frame means supporting said cartridge for movement in a direction parallel to the rotational axis of said spindle,



lever means pivoted to said frame means and engaged at one end to said cartridge, and actuator means for actuating said lever means to move said one end in a direction parallel to the rotational axis of said spindle.

4,049,209

PROCESS AND DEVICE FOR FORMING A TRANSFER TAIL

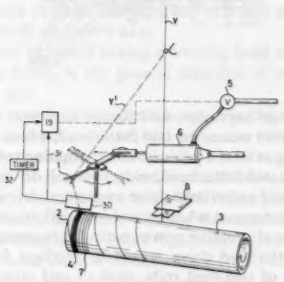
Josef Bach, Leiterhofen; Horst Kollwig, Augsburg; Wolfgang Meitzner; Horst Weintritt, both of Bobingen, and Ralf Ueberdiek, Augsburg, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 478,277, June 11, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,495

Claims priority, application Germany, June 18, 1973, 2330961

Int. Cl.[2] B65H *54/34*

U.S. Cl. 242—18 PW **12 Claims**



1. A process for forming an adjustable and reproducible transfer tail of yarn wound on a winding bobbin on a high-speed winding frame having a reciprocating thread guide moving through a planar operating zone having forward and reverse traverse limits and an auxiliary rotatable thread guide having a substantial grooved recessed portion for releasably engaging the yarn, the auxiliary rotatable thread guide being initially engaged with the yarn outside of the forward traverse limit of the planar operating zone for holding it in position to form a waste ridge on the bobbin, the process comprising the steps of applying sufficient rotational force to the auxiliary thread guide to positively and automatically rotate it at a predetermined angular speed independent of fluctuations in yarn tension or in surface properties of the yarn whereby preselected turns of yarn are consistently wound as a transfer tail on the bobbin, and continuing rotation of the auxiliary thread guide to rotate the grooved recessed portion forward traverse limit end of the operating zone of the reciprocating thread guide, releasing the yarn from the recessed portion to transfer it at a predetermined coordinated speed to the reciprocating thread guide after the transfer tail is completed to permit the winding to then proceed without undue sliding between the yarn and thread guides to completion under control of the reciprocating thread guide whereby the stress and damage to the yarn is minimized.

4,049,210

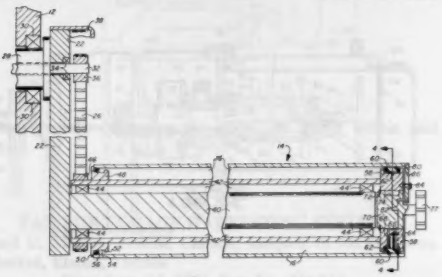
STRAND WINDING APPARATUS

John H. Pierce, Reidsville, N.C., assignor to The John Pierce Co., Inc., Reidsville, N.C.

Filed July 30, 1975, Ser. No. 600,327

Int. Cl.[2] B65H *54/02, 54/44*

U.S. Cl. 242—18 R **12 Claims**



1. In an apparatus for winding a textile strand onto a bobbin to form a strand package, said apparatus including a frame, a generally horizontally-extending spindle assembly adapted to mount said bobbin for rotation about a central axis during operation of said apparatus, strand-guiding means for guiding the strand onto the bobbin during operation of said apparatus, said strand-guiding means including a pressure roll extending generally parallel to said spindle assembly and engagable with the periphery of the strand package formed upon said bobbin carried by said spindle assembly during operation of said apparatus, and movable support means carried by said frame and mounting said spindle assembly for translatory movement toward and away from said pressure roll, the improvememt comprising:

said spindle assembly including inner and outer elongate spindle members extending in substantially concentric relationship to each other and to said central axis of said spindle assembly throughout substantially the entire length of said assembly, said inner member being of massive rigid construction and being fixedly and immovably secured at one end thereof to said support means for movement in unison therewith, first and second bearing means disposed between said inner and outer spindle members adjacent opposite ends of said members, said bearing means mounting said outer member for translatory movement in unison with said inner member relative to said pressure roll and mounting said outer member for rotative movement relative to said inner member about said central axis of said spindle assembly;

bobbin-gripping means carried by said spindle assembly for when actuated releasably securing said bobbin upon said outer member of said assembly during operation of said apparatus;

drive means, operatively connected to said spindle assembly separately from and independently of said support means, for during operation of said apparatus imparting rotative movement to said outer spindle member and to said bobbin secured thereon;

said support means including a cylindrical journal member, and bearing means innerconnecting said journal member and said frame of said apparatus for direct support of said journal member by said frame; and said drive means including a rotatable drive shaft extending freely and gener-

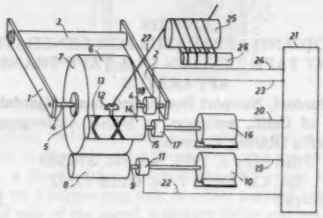
ally co-axially through said journal member in radially-spaced relationship thereto.

4,049,211

WINDING APPARATUS FOR TEXTILE THREADS

Gelli Spescha, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Nov. 2, 1976, Ser. No. 738,086
Claims priority, application Switzerland, Nov. 5, 1975, 14252/75
Int. Cl.² B65H 59/38
U.S. Cl. 242—45 14 Claims



1. A winding apparatus for textile threads comprising

a rotatable bobbin chuck for forming a bobbin package thereon;

a friction drive drum for rotating a bobbin package on said chuck;

a thread guide for guiding a thread to said bobbin chuck to form a bobbin package;

a helical groove shaft for moving said thread guide transversely of said chuck;

a first drive having a speed control for rotating said friction drive drum;

a second drive having a speed control for rotating said helical groove shaft;

an electronic control unit including first means for calculating the rotational speed (f_{RS}) of said friction drive drum as a function of the thread speed in accordance with a mathematical formula, said means receiving the desired value of the thread speed (V_F) and the desired value of the rotational speed of said helical groove shaft (f_C) wherein said speed control of said first drive adjusts the speed of said friction drive drum in accordance with the calculated rotational speed (f_{RS}).

4,049,212

APPARATUS FOR INDEPENDENTLY REWINDING SLIT STRIPS IN A WEB SLITTING AND REWINDING MACHINE

Toshiaki Yamaguchi, and Jinichi Shoji, both of Kyoto, Japan, assignors to Nishimura Seisakusho Co., Ltd., Kyoto, Japan

Filed July 19, 1976, Ser. No. 706,781
Claims priority, application Japan, July 21, 1975, 50-89952
Int. Cl.² B65H 19/04, 17/08
U.S. Cl. 242—56.9 8 Claims

1. Apparatus for independently rewinding a plurality of slit strips in a web slitting and rewinding machine comprising:

a contact roller supported for rotation at a fixed position:

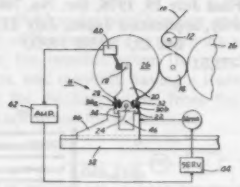
a plurality of slit strip rewinding cores arranged generally parallel to the axis of said contact roller at least in one row for contact with said contact roller;

a plurality of support means for rotatably supporting said rewinding cores, respectively;

a common support base for said plurality of support means, said common support base pivotally carrying said support means to allow said support means to swing for a limited angular range;

means for detecting any angular displacement of at least one of said support means to provide control signals; and

drive means for moving said common support base in response to said control signals in such a manner that said



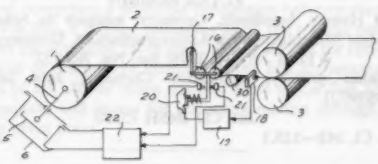
slit strip rewinding cores may be moved away from said contact roller according as the diameter of each of the rewound rolls on said rewinding cores is increased, each of said rewound rolls being kept in contact with said contact roller.

4,049,213

AUTOMATIC REGULATION OF THE POSITION OF THE LATERAL EDGE OF A TRAVELLING WEB

Dietrich Hank; Gerhard Lipfert, and Tassilo Niesgoda, all of Leipzig, Germany, assignors to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Filed Apr. 27, 1976, Ser. No. 680,875
Claims priority, application Germany, May 12, 1975, 185938
Int. Cl.² B65H 25/26
U.S. Cl. 242—57.1 17 Claims

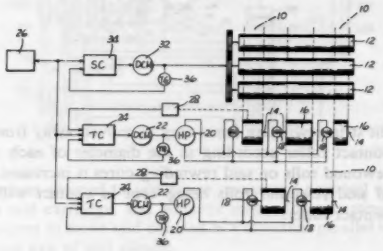


1. In an apparatus for transporting an elongated web along a predetermined path, a regulating system for automatically keeping the position of the lateral edge of the travelling web within preselected first and second tolerance ranges, the regulating system comprising, in combination, sensing means operative for sensing the position of the lateral edge of the travelling web; position-correcting means operative when activated for effecting corrective movement of the travelling web in a direction causing the lateral edge thereof to change position; and regulating means connected to the sensing means and to the position-correcting means and operative for causing the latter to effect corrective movements of the travelling web at a first speed when the sensed position of the web edge is outside the first tolerance range and at a different second speed when the sensed position of the web edge is outside the preselected second tolerance range, the first tolerance range being a narrower tolerance range and the second tolerance range being a wider tolerance range, the first speed being a lower speed and the second speed being a higher speed.

4,049,214
METHOD AND APPARATUS FOR DRIVING REWINDING SHAFTS FOR SLIT STRIPS

Toshiaki Yamaguchi, and Jinichi Shoji, both of Kyoto, Japan, assignors to Nishimura Seisakusho Co., Ltd., Kyoto, Japan

Filed July 19, 1976, Ser. No. 706,782
Claims priority, application Japan, July 21, 1975, 50-89953
Int. Cl.[2] B65H *59/00*
U.S. Cl. 242—75.51 4 Claims



1. A method of rewinding a plurality of slit strips into rolls on separate rewind shafts comprising

driving a first hydraulic pump connected to a first group of said shafts;

driving a second hydraulic pump connected to a second group of said shafts;

interconnecting a first plurality of variable volume hydraulic motors in parallel between said first hydraulic pump and said first group of shafts;

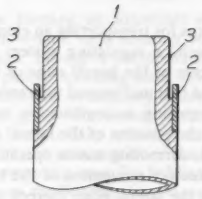
interconnecting a second plurality of variable volume hydraulic motors in parallel between said second hydraulic pump and said second group of shafts; and

providing control means to control said hydraulic pumps to rotate said shafts separately with independent adjustment of the volume of each said hydraulic motor in relation to the width of the respective strip being rewound.

4,049,215
FLYER BOBBIN

Gerd Husges, Ingolstadt, Germany, assignor to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Germany

Filed July 16, 1976, Ser. No. 705,772
Claims priority, application Germany, July 24, 1975, 7523559[U]
Int. Cl.[2] B65H *75/28*
U.S. Cl. 242—125.1 2 Claims



1. A flyer bobbin for receiving roving comprising:

an elongated cylindrical barrel;

a longitudinally extending groove provided in the surface of said barrel;

an elongated resilient clamping member having one end secured to said barrel in said groove and the other end extending therefrom;

a flattened area on the surface of said barrel directly adjacent one end of said groove directly under said other end of said resilient clamping member.

said one end of said resilient clamping member being substantially flush with the periphery of said barrel so as not to interfere with the winding of roving on said barrel; and

said end of said roving being secured between said flattened area on said barrel and said other end of said resilient clamping member for holding sand roving against said barrel in order to initiate the winding of said roving thereon.

4,049,216
METHOD AND APPARATUS FOR GENERATING CONSTANT TAPE TENSION IN A TAPE TRANSPORT APPARATUS

Donald L. Burdorf, Newport Beach, and James Bjordahl, Arcadia, both of Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 6, 1975, Ser. No. 574,959
Int. Cl.[2] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—192 2 Claims

1. In a tape transport of the type having supply and take-up reels on shafts rotatably mounted on relatively movable supports and having means biasing said reels, by way of said supports, toward a rotatably mounted driving capstan having a resiliently deformable peripheral portion, with a substantially constant, reel-size independent force in such a way that the bias of said take-up reel towards said capstan is greater in magnitude than the bias of said supply reel toward said capstan,

a method of minimizing the effects of reel size upon the level of tape tension, said method comprising:

driving each said reel from said capstan through the medium of a relatively thin layer which circumferentially surrounds, and is attached to, said peripheral portion of the capstan, said layer being of flexible but substantially inelastic material and, at the interface between said reel and said capstan, said layer being deformed, together with said peripheral resilient portion, in conformity with the contour of said reel, and the thickness of said layer being chosen substantially according to the equation

$$V_r = V_c(R_r/R_r + t_b/2$$

wherein:

V_r is the velocity of the reel periphery;

V_c is the constant pitch line velocity of the layer;

R_r is the radius of the reel; and

t_b is the thickness of the layer

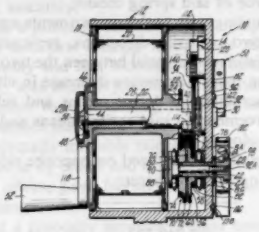
so that, as the diameter of said reel increases and decreases during the tape transport operation, the surface speed of said reel is increased and decreased, respectively, relatively to the speed of the pitch-line of said layer by an amount of the same order of magnitude as, but of a sign opposite to changes in said surface speed due to variations in the rates of elastic flow of said peripheral portion of the capstan as a function of said reel diameter.

4,049,217

FISHING REEL DRIVE MECHANISM

Richard Koopman, 85 Ganby St., West Hartford, Conn. 06002

Filed Oct. 1, 1975, Ser. No. 618,478
Int. Cl.[2] A01K *89/015, 89/02*
U.S. Cl. 242—213 18 Claims



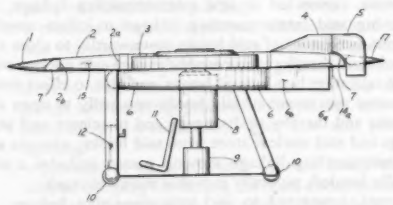
1. A fishing reel comprising a cup-shaped frame, a line spool, means for removably supporting the spool on the frame for rotation, a direct drive transmission and brake subassembly mounted on a supporting axle in offset parallel relation to the rotational axis of the spool, a unitary drive and brake operator selectively movable between first and second positions respectively for establishing a direct drive for spool winding and alternatively actuating the brake while permitting reverse rotation of the spool with a controlled braking force applied thereto for tensioning the line during run-out, means for operatively mounting the direct drive transmission and brake subassembly and the drive and brake operator on the bottom of the cup-shaped frame, a crank operated main rotary drive, means for mounting the rotary drive in coaxial relation to the spool, the direct drive transmission and brake subassembly including a rotary input and a rotary output, the rotary input being drivingly connected to the rotary drive and rotatable thereby in a first angular direction, the rotary output being drivingly connected to the spool to rotate the spool in a line winding direction responsive to rotation of the rotary input in said first angular direction, and a no-back device drivingly connected to the rotary input and limiting its movement against rotation in a direction opposite said first angular direction.

4,049,218

VERTICAL TAKE OFF AND LANDING AIRCRAFT

Lian-Tong Wen, New York, N.Y., assignor to Yung-Heng Wang, Cliffside Park, N.J. and Charles Chang, Honolulu, Hawaii, part interest to each

Filed Mar. 12, 1976, Ser. No. 666,467
Int. Cl.[2] B64C *29/00*
U.S. Cl. 244—23 C 5 Claims



1. An aircraft comprising

an annular wing capable of supporting the aircraft in horizontal flight,

a centrally located impeller having a substantially vertical axis of rotation,

means for moving said impeller axially between an upper position and a lower position,

an annular airstream guide housing within said annular wing and surrounding the periphery of the impeller for receiving air discharged radially from the impeller when the impeller is in the upper position, said airstream guide housing having an annular deflector spaced outwardly from the periphery of the impeller for deflecting downwardly the radially discharged air to provide lift for the aircraft, and

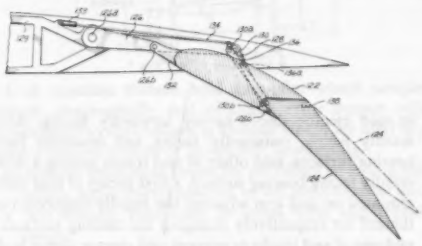
a collecting manifold under said housing and surrounding the periphery of the impeller for receiving air discharged radially from the impeller when the impeller is in the lower position, said manifold having a rearwardly facing exhaust port for discharging air from the manifold to provide forward thrust for the aircraft.

4,049,219

VARIABLE PIVOT TRAILING EDGE FLAP

Roy Delmar Dean, and Richard Herschel Weiland, both ofSeattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 546,578, Feb. 3, 1975, Pat. No. 3,985,319.
This application Mar. 30, 1976, Ser. No. 671,926
Int. Cl.[2] B64C *9/04*
U.S. Cl. 244—217 5 Claims



1. In an airplane wing having a double variable flap comprising: a flap having two parts comprising leading and trailing parts capable of movement with respect to each other, a four-bar linkage with a fore and an aft bar extending from wing support structure to the leading part of the flap, a pivotable linkage extending from the wing support structure to an actuation pivot point, and means for imparting relative movement between the leading and trailing parts of the flap through the actuation pivot point wherein the means for imparting relative movement comprises: a pivotable connection between the two parts of the flap, a linkage extending from the trailing part of the flap to the actuation pivot point having an axis for rotation at each end of the linkage identical to the axis for rotation at each end of the aft bar when the two parts of the flap are in cruise position, and means for imparting motion through the actuation pivot point.

4,049,220

EJECTOR SLEEVES FOR AIRCRAFT MOUNTED GAS TURBINE ENGINES

Leonard John Rodgers, Spondon, England, assignor to Rolls-Royce Limited, London, England

Filed Aug. 30, 1976, Ser. No. 718,470
Claims priority, application United Kingdom, Sept. 12, 1975, 37534/75
Int. Cl.[2] B64D *33/06, 29/00*
U.S. Cl. 244—53 R 2 Claims

1. In a jet propelled aircraft:

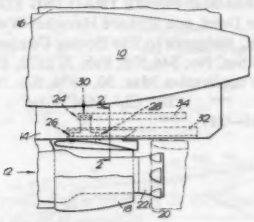
aircraft structure including a fuselage and a stub wing-like member projecting generally horizontally from the fuselage;

a gas turbine engine having an exhaust nozzel with an exhaust outlet, said gas turbine engine being supported in generally horizontally spaced cantilever relationship to said fuselage;

an annular ejector sleeve movable between an upstream position where it surrounds the gas turbine engine and a

downstream position where its upstream end just overlaps a plane of the exhaust outlet in radial spaced relationship to the exhaust nozzle; and

support means for supporting said ejector sleeve independently of said gas turbine engine in generally horizontally spaced cantilever relationship to said fuselage, said support means comprising an arm rigidly attached to one end to said ejector sleeve and projecting generally horizontally therefrom and having a free end, a pair of generally horizontally spaced, longitudinally extending, a parallel tracks supported on said stub wing-like member with one of said tracks being positioned closer to said ejector sleeve than the other said tracks, said one track positioned closer



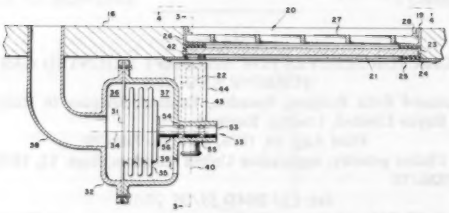
to said ejector sleeve having upwardly facing, downwardly facing, outwardly facing and inwardly facing bearing surfaces, said other of said tracks having a downwardly facing bearing surface, a first group of four rollers mounted on said arm adjacent the regidly connected end thereof for respectively engaging the bearing surfaces of said one of said tracks to prevent said ejector sleeve bodily rotating in planes which contain its longitudinal axis, and at least one roller mounted on the free end of said arm and engaging the downwardly facing bearing surface of said other track for counteracting any bending moment exerted by the weight of the ejector sleeve on the said one track.

4,049,221

RELIEF OF INTER-COMPARTMENT DIFFERENTIAL PRESSURE IN AIRCRAFT

Claude Lloyd Fountain, Granada Hills, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 24, 1975, Ser. No. 644,278
Int. Cl.[2] B64C *1/18*
U.S. Cl. 244—118 R **7 Claims**



1. In an aircraft having a fuselage containing a plurality of compartments which are pressurized when the aircraft is in flight, the improvement comprising:

a wall located between and separating two of the pressurized compartments and containing an opening through which those two compartments may communicate;

a frangible closure extending across the opening and at least partially closing off communication therethrough;

a single striker operable to strike said frangible closure with a force sufficient to break it and thereby permit the rapid flow of air between the two compartments; and

spring means yieldingly urging said striker along a path toward said frangible closure with a force sufficient to break said closure;

detent means for holding said striker in a retracted position against the force of said spring means;

means communicating with both compartments andmovable in either of two opposite directions, repsonsive to an increase in pressure differential between the two compartments resulting from a presssure decrease in either compartment to actuate said detent means and release said striker for movement by said spring means and breaking said frangible closure;

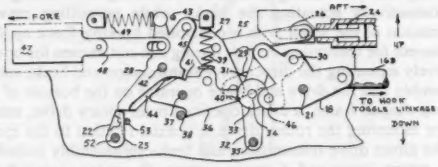
whereby the pressure is equalized on opposite sides of said wall, preventing damage thereto.

4,049,222

EJECTOR RACK FOR NUCLEAR STORES

Paul F. Peterson, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 20, 1976, Ser. No. 707,139
Int. Cl.[2] B64D *1/04*
U.S. Cl. 244—137 R **8 Claims**



1. An ejector rack for releasably supporting, and for selectively ejecting forcibly, a nuclear store from an aircraft, wherein said store has a plurality of lugs from which said store is removably engaged with and to said ejector rack, comprising:

a. means for releasably supporting said removably engaged nuclear store by said store lugs, wherein said support means includes:

1. two oppositely disposed hooks configurated and dimensioned to accept and to removably engage said nuclear store by said store lugs, with said hooks at a distance of 30 inches from each other;

2. suitable dimensioned and configurated linkage, disposed between, and interconnecting, said oppositely disposed hooks, whereby said responsive simultaneously to any movement of said interconnecting linkage;

3. means, connected to said interconnecting linkage, for moving said interconnecting linkage to effect simultaneous movement of said hooks downwardly to close said hooks and thereby to removably engage said nuclear store and said store lugs by said hooks, and also to effect simultaneous movement of said hooks upwardly to open said hooks and thereby to disengage and to release said store lugs and said nuclear store from said hooks, wherein said interconnecting linkage moving means includes a centrally located, pivotally movable main bellcrank;

4. means, connected to said interconnecting linkage, for selectively preventing any movement of said interconnecting linkage, wherein said linkage movement prevention means includes:

aa. a first safety lock assembly that further includes a first locking member pivotally rotatable about a first shaft, with said first locking member selectively movable to a lock position and to an unlock position;

bb. a second safety lock assembly that further includes a second lbcking member pivotally rotatable about said first shaft independently of said first locking member of said

first safety lock assembly, with said second locking member aligned with said first locking membe, and with said second locking member selectively movable to the same lock position, and also to the same unlock position, as said first locking member, and also with said second safety lock assembly operatively associated with said first safety lock assembly;

cc. and, a plurality of iinterlinked components common to both said first locking member of said first safety lock assembly and said second locking member of said second safety lock assembly, wherein said interlinked components common to both locking members and both lock safety assemblies include:

11. a pivotally movable release pawl component selectively abutable by either and both of the locking members, with said release pawl having a lock position and an unlocked position;

22. and a pivotally movable trigger component selectively abuttable by said release pawl component, with said trigger component linked to said main bellcrank of said interconnecting linkage movement means;

whereby, when both said locking members of said safety lock assemblies are moved to said lock position, said release pawl component locks with said trigger component, and said trigger component locks with said common interlinked components, and said common interlinked components lock with said main bellcrank, thereby preventing any movement of said interconnecting linkage of said support means, and thereby preventing release and ejection of a nuclear store supported and engaged by said hooks of said support means;

5. and, means connected to said interconnecting linkage moving means, for preventing acceleration forces from acting on said interconnecting linkage moving means and inadvertently causing said interconnecting linkage moving means to move said interconnecting linkage to open said hooks and thereby to disengage and to release said store lugs and said nuclear store from said hooks, wherein said inadvertent release prevention means includes a counterbalance system which further includes a plurality of counterweights having a total mass which is equal to a total mass of those components which can cause the inadvertent release of said supported and engaged nuclear store;

b. means for selectively ejecting said nuclear store forcibly, with said ejection means operatively associated with said support means, wherein said ejection means includes:

1. a plurality of ejection piston cylinders connected to said attachment means, with each said cylinder of said plurality of ejection piston cylinders having an upper portion, a metering probe disposed within said cylinder and releasably connected to the upper portion of the cylinder, and an open-ended lower portion;

2. a plurality of ejection pistons, with a piston for each of said plurality of ejection piston cylinders, and with each said piston of said plurality having a head with an opening therein, with said opening dimensioned and shaped to accept said metering probe of said cylinder, and with said metering probe removably fitted into said piston head opening;

3. a plurality of ejection piston cylinder lower end plugs, with an end plug for closing the open-ended lower portion of each cylinder of said plurality of cylinders, and with each said end plug removably fitted into the open-ended lower portion of its respective cylinder;

4. and, a plurality of ejection piston cylinder springs, with a spring for each of said plurality of ejection piston cylinders, and with each spring disposed internal of its respective cylinder, and also with each said spring interposed between and captured by its respective metering probe and its respective end plug;

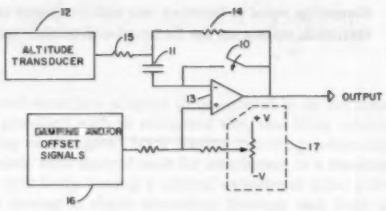
c. and, means for attaching said support means and said ejection means to said aircraft, with said attachment means also functioning as a housing means for said support means, said ejection means, and said attachment means.

4,049,223

CONSTANT ALTITUDE AUTO PILOT CIRCUIT

William S. Watson, Tucson, Ariz., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 21, 1976, Ser. No. 699,007
Int. Cl.[2] G05D *1/08*
U.S. Cl. 244—180 **4 Claims**



1. A constant altitude hold auto-pilot which samples an altitude electronically and produces error output voltages proportional to the changes in altitude which are used to command a control system of an aircraft, comprising:

an altitude transducer means for providing an analog altitude output signal corresponding to the altitude of an aircraft;

a first resistor connected in series with said transducer means;

a high impedance input operational amplifier having a positive input, a negative input and an output;

a second resistor connected between the output of said first resistor and the output of said operational amplifier;

a low leakage capacitor connected between the output of said first resistor and the negative input of said operational amplifier; and,

a switch connected between the negative input of said operational amplifier and the output of said operational amplifier, and said switch, when closed, allows said capacitor to charge to a voltage proportionate to the output of said transducer by the operating characteristics of said amplifier, and said switch, when opened on an externally applied altitude hold command signal, allows the capacitor to be in series with the present altitude signal thereby causing the error signal to be amplified by said operational amplifier.

4,049,224

CHAIN-LINK FENCING PACKAGE AND METHOD OF MAKING SAME

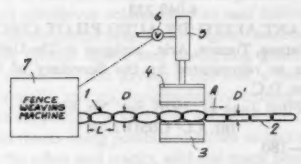
Kurt Wener; Günter Stock; Klaus Herrig, and Heinz Wagner, all of St. Ingbert, Germany, assignors to ARBED, Acieries Reunies de Burbach-Eich-Dudelange, Luxembourg, Luxembourg

Continuation-in-part of Ser. No. 471,907, May 21, 1974, abandoned. This application Aug. 27, 1975, Ser. No. 608,340
Claims priority, application Germany, May 26, 1973, 2327005
Int. Cl.[2] B21F *27/04*
U.S. Cl. 245—6 **2 Claims**

1. A method of making a package of chain-link fencing, said method comprising the steps of:

weaving round-section metal wire provided with a protective synthetic-resin covering into a mesh of interlinked wire coils having a transverse thickness equal to between five and eight times the overall diameter of the coated wire,

flattening the coils of said mesh immediately following weaving thereof to reduce said transverse thickness to a



dimension equal to between two and four times said diameter, and, rolling up the flattened-coil mesh.

4,049,225

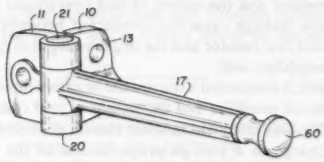
MOUNTING BRACKET HAVING HINGED BASE

Lee Richard Chasen, Port Chester, and Ruediger Einhorn, Katonah, both of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.

Division of Ser. No. 598,399, July 23, 1975, abandoned. This application May 12, 1976, Ser. No. 686,048

Int. Cl.[2] F16M *13/02*

U.S. Cl. 248—219.4 **8 Claims**



1. A mounting bracket adapted to be mounted on flat, curved and angular surfaces,

comprising first and second base members each having a substantially flat mounting surface and being hinged together for relative angular displacement about an axis displaced from and parallel to the planes of the mounting surfaces, whereby said second base member may be rotated from one position at which the planes of the mounting surfaces coincide and another position at which the planes of the mounting surfaces are normal to each other, the material of each member extending only on one side of the plane of the respective mounting surface, said axis extending through each base member,

said first base member having a first edge extending normal to the respective mounting surface at a side thereof facing said axis, said second base member having a second edge extending normal to the respective mounting surface at a side thereof facing said axis, said first and second edges extending parallel to said axis and being spaced apart, said first and second edges being positioned to engage the mounting surfaces of said second and first base members respectively to limit the minimum angle between the planes of said mounting surfaces,

said first base member further comprising a fixed mounting projection extending therefrom substantially at said axis.

4,049,226

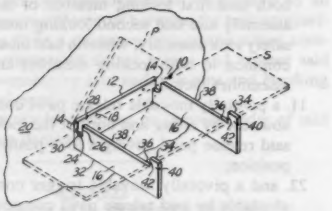
HORIZONTAL SHELF AND VERTICAL PANEL BRACKET

Louis A. Harvey, 15107 Ilene St., Detroit, Mich. 48238

Filed May 10, 1976, Ser. No. 684,538

Int. Cl.[2] A47G *29/02*

U.S. Cl. 248—248 **1 Claim**



1. A supporting bracket for horizontal shelves and vertical panels, comprising

a substantially U-shaped one-piece bracket structure consisting of a single strip of sheet material including a horizontally-elongated bridge portion adapted to be secured to an upright supporting structure,

and a pair of elongated arm portions extending perpendicularly outward in laterally-spaced parallel relationship from the opposite ends of said bridge portion,

each arm adjacent its junction with said bridge portion having a downwardly-extending vertical panel-receiving notch therein,

each arm also having an elongated horizontal shelf-receiving recess in the upper edge thereof extending horizontally outward therealong remote from its respective notch and having a length a multiplicity of times the width of its respective notch,

each arm near its outer end having an upstanding stop portion therein disposed remote from its respective notch, and each recess terminating at its outer end at its respective stop portion.

4,049,227

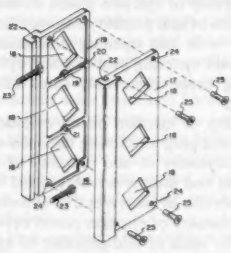
MOUNTING ARRANGEMENT FOR ELECTRICAL COMPONENTS AND ELECTRICAL COMPONENT CASES ADAPTED TO BE USED THEREWITH

Thomas Georgopulos, Chicago, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Continuation of Ser. No. 393,267, Aug. 30, 1973, abandoned. This application Apr. 14, 1976, Ser. No. 676,780

Int. Cl.[2] A47F *5/00*

U.S. Cl. 248—309 R **5 Claims**



1. A mounting arrangement for facilitating the mounting of component cases having projecting retaining tabs comprising:

an elongated mounting block having a longitudinal axis, being of a predetermined substantial thickness, and having front and rear major surfaces;

a plurality of openings arranged in longitudinal spaced relation in said block, each said opening defined by intersecting rectangular cut out portion parts of substantially equal dimension, wherein the longitudinal axis of each said rectangular cut out portion is substantially 45° relative to said block longitudinal axis, and wherein the longitudinal axis of each rectangular cut out portion pair are substantially at right angles and bisecting each other; and

a first pair of mounting ridges along the minimum dimension sides of a given one of each said rectangular cut out portion pairs, said first pair of mounting ridges being immediately adjacent one of said major surfaces and being relatively thin in cross sectional thickness relative to said predetermined substantial thickness of said block, and a second pair of mounting ridges along the minimum dimension sides of the other one of each said rectangular cut out portion pairs, said second pair of mounting ridges being immediately adjacent the other one of said major surfaces and being relatively thin in cross sectional thickness relative to said predetermined substantial thickness of said block, whereby,

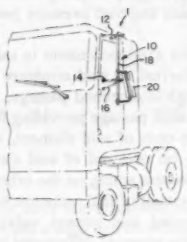
the first and second pairs of mounting ridges of each said opening are oriented substantiallly at right angles to one another and arranged for independently receiving cooperating retaining tabs carried by component cases to be mounted on said block to facilitate the external mounting of such component cases to both major surfaces of said block.

4,049,228

ADJUSTABLE TRUCK SIDE MIRROR SYSTEM ADJUNCT

William A. Skewis, P.O. Box 251, Sequim, Wash. 98882

Filed Apr. 19, 1976, Ser. No. 678,141
Int. Cl.[2] B60R *1/06*
U.S. Cl. 248—480 **5 Claims**



1. A vertically positioned mirror unit connected to the cab door of a truck, comprising:

a mounting bracket including (1) upper arms secured above the side window of the cab door of the truck extending laterally outwardly therefrom, and (2) lower arms secured beneath the side window of the cab door of the truck extending laterally outwardly therefrom essentially parallel to the upper arms,

a vertically oriented mirror support bar secured to the upper and lower arms and extending a substantial distance below the lower arms of the mounting bracket,

an upper and lower mirror support extension extending laterally from the vertical bar, the upper mirror support extension secured to the bar so that the upper terminating edge of the mirror does not impair the forward lateral vision of the driver of the truck while allowing unobstructed rear vision and the lower mirror support extension is secured to the bar beneath the side window of the cab door of the truck,

a U-shaped mirror mounting bracket having parallel arms pivotally secured at their respective ends to the upper and lower mirror support extensions, and

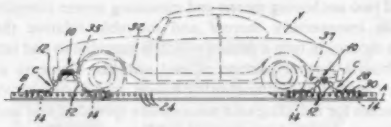
a mirror supported for pivotal adjustment to the U-shaped mirror mounting bracket.

4,049,229

HOOK

Israel Daniel Peisner, Huntington Woods, Mich., assignor to Whitehead & Kales Company, River Rouge, Mich.

Filed June 25, 1976, Ser. No. 699,803
Int. Cl.[2] B60P *7/08*
U.S. Cl. 248—503 **2 Claims**



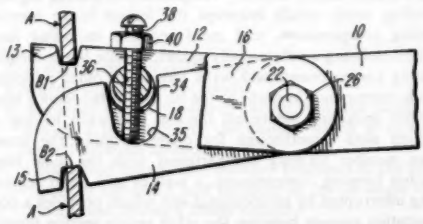
1. A hook structure adapted to be secured in an anchorage member provided with an elongated slot, said hook structure comprising an elongated body having attaching means adjacent opposite ends thereof each for attachment to a tensioning element, said body having a central cylindrical hole, a bolt, said bolt having a shank extending through said hole and adapted to enter and turn in said slot, said shank having a cross head at one end and a retainer at the other end, said cross head and retainer being disposed at opposite sides of said body and having maximum dimensions greater than the diameter of said hole to retain said bolt and body in assembled relation, said cross head being of a length greater than and a width less than the width of the slot to permit said bolt shank to be inserted head first into the slot from one side of the anchorage member when said cross head is disposed lengthwise of the slot and then to be rotated to dispose said cross head crosswise of the slot to bear against the opposite side of the anchorage member, said bolt shank having a first portion adjacent said cross head of such non-circular cross section as to prevent rotation of said bolt by engagement with the side walls of the slot when said cross head is disposed crosswise of the slot and bears against such opposite side of the anchorage member, said bolt shank having a cylindrical portion more remote from said cross head than said first portion permitting rotation of said bolt when said bolt shank is inserted further into the slot to move said head away from such opposite side of the anchorage member, said body being free to turn on said cylindrical portion of said bolt shank in response to varying tension in the tensioning elements and to bear against said retainer to hold said cross head in bearing contact with such opposite surface of the anchorage member.

4,049,230

BRACKET DEVICE

Carl E. Minniear, Dingman Slagel Road., R.R. No. 5, Sidney, Ohio 45365

Filed Feb. 6, 1976, Ser. No. 656,013
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—539 **13 Claims**



1. Bracket apparatus comprising at least two anchoring

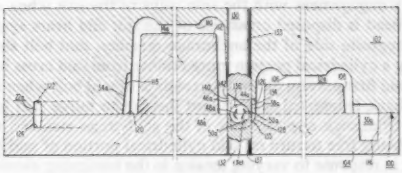
means pivotally mounted to adapt their projected end portions to be disposed in an opening between opposite edge portions of a base structure to which the bracket is intended to mount, means for inducing a scissors-like spread of said anchoring means to have remote portions thereof engage to the said opposite edge portions of said base structure, means defining a mounting device interconnected with said anchoring means and adapted to be supported thereby and in a fixed relation thereto, said anchoring means being formed by a plurality of arm-like elements having a common means to which they mount, a first portion of said arm-like elements providing one of said two anchoring means and mounting means extending in a sense transversely thereof and movable relative thereto which mounts in turn a device which is movable to and retractable from a further portion of said arm-like elements which forms a second of said anchoring means, said device providing said means for inducing said scissors-like spread of said anchoring means, being a screw and said transversely extending means being a pivot which is mounted for rotative movement in said first portion of said arm-like elements.

4,049,231

MOLD FOR MANUFACTURING AN INTEGRALLY MOLDED BALL AND SOCKET TYPE HINGE

Michael Lutz, 226 High Tor Drive, Watchung, N.J. 07060

Filed Jan. 7, 1976, Ser. No. 647,088
Int. Cl.[2] B29C *11/00*
U.S. Cl. 249—64 **13 Claims**



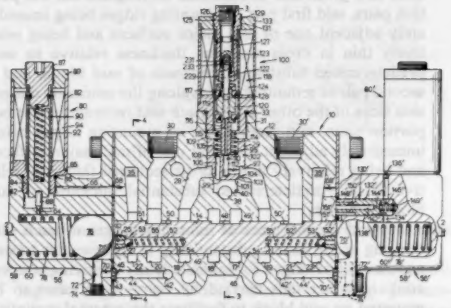
1. A mold for use in forming an article including two sections articulated to one another by at least one hinge that includes a substantially spherical male hinge member disposed within a recess provided by a surface of a female hinge member said hinge including rib means for confining the male hinge member within said recess, said mold including upper and lower mold sections which, when brought into engagement with each other, include section forming compartments for molding said article sections adjacent to one another, a female hinge member forming compartment communicating with one of the article section forming compartments, a mold segment including walls which interrupt the female hinge member forming compartment, said mold segment including inner surfaces defining a substantially spherical male hinge member forming compartment, said walls having an outer periphery which corresponds in shape to the surface of the female hinge member providing the recess therein, said walls having rib defining slots therethrough for communicating the female hinge member forming compartment with the male hinge member forming compartment, a wall of said mold segment being interrupted by an additional slot which provides a communicating passage between the other article section forming compartment and the male hinge member forming compartment.

4,049,232

PRESSURE COMPENSATING FLUID CONTROL VALVE

James Otto Byers, Jr., Racine, Wis., assignor to Tomco, Inc., Racine, Wis.

Division of Ser. No. 403,509, Oct. 4, 1973, Pat. No. 3,893,471.
This application June 25, 1975, Ser. No. 590,344
Int. Cl.[2] F16K *31/383*
U.S. Cl. 251—30 **11 Claims**



1. A proportional solenoid valve assembly for controlling the flow rate of fluid between an inlet passage and a pressure passage in a hydraulic valve, said assembly comprising:

a poppet valve element for controlling the flow of fluid between the inlet passage and the pressure passage,

a housing mounted on the hydraulic valve in a spaced relation to said poppet valve element, means in said space for biasing said poppet valve element to a closed position, said poppet valve element including a first passage providing fluid communication between said inlet passage and said space and a second passage providing fluid communication between said space and said pressure passage,

a coil in said housing,

an armature mounted for axial movement in said coil,

a pilot valve element carried by said armature for controlling fluid flow through said second passage,

said element having an axial passage providing fluid communication between the ends of said element, whereby the fluid pressure acting on one end of said element is balanced by the fluid pressure acting on the other end of said element and the movement of said armature will open said second passage allowing said poppet valve element to open in response to the pressure differential between inlet pressure and the sum of the forces exerted on the poppet valve element by said biasing means and the pressure of the fluid in said space.

4,049,233

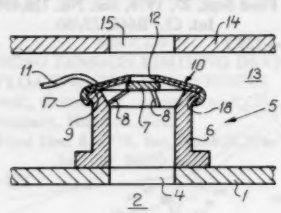
DEVICE FOR ESTABLISHING AND BREAKING A FLUID COMMUNICATION

Johan A. I. Brandin, Norrkoping, Sweden, assignor to Stal Refrigeration AB, Norrkoping, Sweden

Filed Sept. 30, 1976, Ser. No. 728,124
Claims priority, application Sweden, Oct. 3, 1975, 7511100
Int. Cl.[2] F16K *31/126*
U.S. Cl. 251—61.1 **3 Claims**

1. In combination with first and second wall means forming first and second openings, respectively, said openings being spaced from each other and facing each other in substantially coaxial relation, a device surrounding said first opening for establishing and breaking fluid communication between the openings, said device comprising an inflatable ring operable, when inflated, to seal against the second wall means around the second opening to complete a fluid flow path between said

openings, and a generally circular body located in said flow path in coaxial relation to the ring, said ring in its deflated state



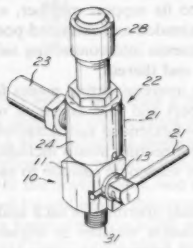
bearing sealingly against said body to prevent flow through said first opening.

4,049,234

SAFETY COCK

John A. Spisak, Avon, Ohio, assignor to The Pipe Line Development Co., Cleveland, Ohio

Filed Aug. 11, 1975, Ser. No. 603,644
Int. Cl.² F16K *5/04, 51/00*
U.S. Cl. 251—149.9 **3 Claims**



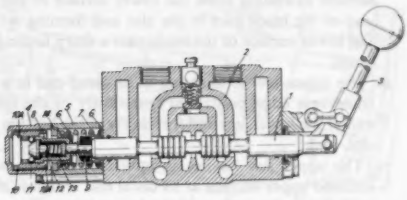
1. A safety cock for positively maintaining a coupled connection between a fluid delivery conduit and a chamber during fluid delivery to the chamber and for permitting said conduit to be uncoupled when fluid delivery is disestablished, comprising a block adapted to be connected to a chamber, a passageway through and defined by said block, a valve in said passageway for alternately opening and closing said passageway, said valve comprising a cylindrical shaft within a bore in said block and intersecting said passageway, said shaft having a transverse bore therethrough adapted to communicate with said passageway when said shaft is in a first rotative position and adapted to be offset from said passageway when such shaft is in a second rotative position so that said passageway is blocked by said shaft, a projecting nipple having a planar face at which one end of said passageway terminates, groove means in said nipple extending transversely with respect to the axis of said passageway for laterally receiving and coupling said conduit to said block, said groove means including portions on diametrically opposite sides of said axis whereby said groove means is capable of solely preventing axial separation of said conduit from said nipple, a handle connected to said shaft for rotating said shaft between first and second rotative positions, said handle intersecting a plane defined by said planar face when said shaft is in its first rotative position and clearing said plane when said shaft is in its second rotative position.

4,049,235

DETENTS FOR LOCKING MOVABLE ELEMENTS

Anthony Singleton, Grantham, England, assignor to Kontak Manufacturing Company Limited, Great Britain

Filed Feb. 19, 1976, Ser. No. 659,516
Claims priority, application United Kingdom, Feb. 19, 1975, 06902/75
Int. Cl.² F15B *13/01*
U.S. Cl. 251—297 **1 Claim**



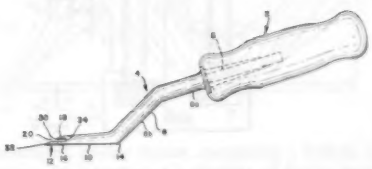
1. A control device having a housing, a control element which is shiftable in the housing between first and second positions, an operating member connected to the control element and operable manually to shift the control element, return spring means continuously biassing the control element towards the first position, the control element being shiftable beyond the second position in a direction away from the first position, second spring means arranged to augment the manual effort required to shift the control element beyond the second position, and releasable detent means for holding the control elements at the second position, said detent means comprising a cage member having a bore and shiftable to permit the control element to shift to the second position, a carrier axially slidable in said bore and attached to said control element, a resiliently depressible element arranged in the carrier and pressing on said bore, means defining a recess in said bore engageable by said depressible element to effect detent, and stop means fixed to said housing and engageable by the cage member and allowing the cage member to shift within limits defined by the stop means in directions parallel with the axis of the bore.

4,049,236

TOOL FOR REMOVING STAPLES

Carl E. Grill, 1432 E. Second St., and Phillip M. Levi, Jr., 2600 Knollwood, both of Casper, Wyo. 82601

Filed Nov. 5, 1976, Ser. No. 739,260
Int. Cl.² B25C *11/00*
U.S. Cl. 254—28 **1 Claim**



1. A staple remover comprising

a. a generally cylindrical handle,

b. a unitary shank projecting axially from the handle and having a part adjacent the handle which is upwardly bowed between its ends,

a blade part formed as a forward extension of the bowed part of the shank and forming an obtuse angle therewith, and having a lower surface,

the entire lower surface of the blade part extending in a straight line from the obtuse angle area to lie flat on a surface in which a staple is embedded, and

c. a work part forming the forward end of the blade part having a surface at its distal end, and comprising

i. Spaced lower and upper jaws separated by a horizontal slot which extends rearwardly from the distal end of the work part entirely across the work part and is of sufficient height to receive the bridge of a staple,

ii. The lower jaw having curved side edges which converge to a point at the distal end of the lower jaw and having an upwardly and rearwardly inclined upper surface extending from the lower surface of the distal end of the blade part to the slot and forming with the flat lower surface of the blade part a sharp leading edge point,

iii. The upper jaw terminating at its distal end in a sharp transverse edge positioned rearwardly of the forward end of the lower jaw and forwardly of the bottom of the slot, and

iv. The upper jaw having an upwardly and rearwardly inclined upper surface at its distal end which is aligned with the upper surface of the lower jaw.

4,049,237

APPARATUS FOR OBTAINING SUBSTANTIALLY EQUAL STEPLENGTH OF EACH JACK IN A GROUP OF PRESSURE FLUID OPERATED CLIMBING JACKS

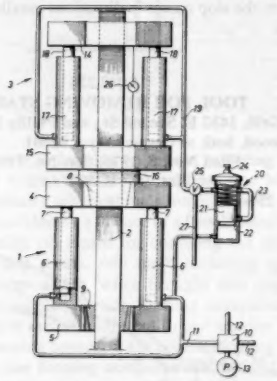
Arne Mattson, Vasteras, Sweden, assignor to Paul Anderson Industrier AB, Vasteras, Sweden

Filed Nov. 19, 1976, Ser. No. 743,254

Claims priority, application Sweden, Dec. 18, 1975, 75143826

Int. Cl.² B66F 1/00

U.S. Cl. 254—106 **5 Claims**



1. In an apparatus for obtaining substantially equal step lengths in a group of pressure fluid operated climbing jacks having pressure cylinders, said climbing jacks used for lifting or lowering a common object, the improvement comprising at least one compensating jack and having a pressure cylinder, said compensation jack in a load transfer relationship with each climbing jack, means to transfer substantially the load to the associated climbing jack from the compensating jack, means to actuate said compensating jack when the climbing jack has carried out a full stroke without reaching said equal step length, wherein a complementary movement of the load is effectuated.

4,049,238

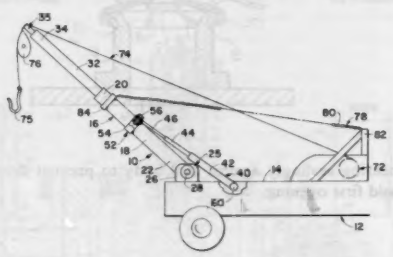
PORTA-CRANE

Harold E. Brown, 419 W. 101st St., Chicago, Ill. 60628

Filed Sept. 27, 1976, Ser. No. 726,698

Int. Cl.² B66C 23/60

U.S. Cl. 254—139.1 **3 Claims**



1. A truck crane for use on a vehicle frame, comprising:

A. a support frame including a pair of spaced apart support members,

B. means for pivotally mounting said support members at substantially one end thereof between operative and inoperative positions,

C. an extension device cooperatively associated with said support members, said extension device comprising a pair of extension members, each extension member and a respective support member being interfitted one within the other and being slidable and longitudinally adjustable relatively to its support member, so as to be adjustable between extended and retracted positions,

D. bridging means interconnecting said extension members at the free end thereof,

E. releasably interconnecting means for retaining said support members and said extension members in longitudinally aligned extended and retracted positions,

F. said interconnecting means including:

1. a band in telescopic relation to each said support member,

2. cooperating apertures in each said support member and said extension member in alignment with each other when said extension members are in said extended and retracted positions, and

3. a fastener associated with each band to extend within said apertures for obtaining a locking relationship therebetween,

G. means for maintaining said support members in laterally spaced relation to each other, said maintaining means including a cross-member extending between said bands of said interconnecting means,

H. hydraulic means pivotally connected at one end thereof to the vehicle frame and at the opposite end pivotally connected to said cross-member, so as to support said support frame in selected operative positions,

I. said hydraulic means includes a cylinder connected to the vehicle frame at one end thereof and a longitudinally extending arm hydraulically powered by and extending from one end of said cylinder and coupled at its opposite end to said cross-member, said hydraulic means being connected to the vehicle frame and to said cross-member in a manner to permit rotating motion therebetween,

J. winch means contained on the vehicle,

K. cable means having a hook at one end extending over said bridging means and connected to said winch means at the opposite end thereof, such that said support frame is adjustable in the operative position extending beyond the vehicle to the inoperative position in which the said support frame is contained on the vehicle and said cable powered by said winch operates the hook in the operative position of said support frame, and

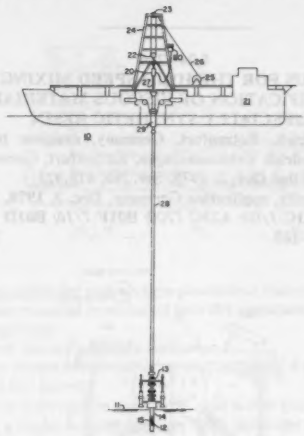
L. adjustable securing means extending between the vehicle and said support frame.

4,049,239

DRILL SPRING TENSION LIMITING DEVICE FOR FLOATING DRILLING VESSELS

James D. Howell, Gretna, La., assignor to Exxon Production Research Company, Houston, Tex.

Filed Dec. 8, 1975, Ser. No. 638,255
Int. Cl.[2] B66D 1/48
U.S. Cl. 254—172 6 Claims



1. In a floating drilling system including a floating drilling vessel having a drilling derrick, a crown block disposed within the derrick, a traveling block which is suspended below the crown block by a hoisting cable which extends through the traveling block and over the crown block, and a string of drill pipe which is suspended by and below the traveling block, an improved apparatus for limiting tension in the drill pipe which is interconnected between the traveling block and the drill pipe which comprises:

a. a cylinder closed at one end and having an opening at the other end;

b. a piston disposed within said cylinder, slideable therewithin and forming a slideable seal with the inner wall thereof;

c. a piston rod connected to said piston, extending through said opening in the end of said cylinder and forming a slideable seal with the wall of said cylinder at said opening;

d. a bypass conduit extending from one side of the piston to the other;

e. a return conduit extending from one side of the piston to the other and a means in said return conduit for permitting flow therethrough to the rod side of the piston from the other side and preventing fluid flow in the opposite direction;

f. means in said bypass conduit for controlling the flow of a fluid therethrough from the rod side of said piston to the other, said means adapted to actuate when pressure on the rod side of the piston reaches a predetermined level to permit sufficient fluid to flow through the said conduit to maintain such pressure at the predetermined level, said means otherwise preventing flow therethrough when said pressure is below said predetermined level; and

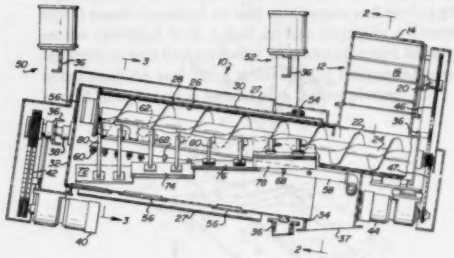
g. means for connecting said piston rod and said cylinder to the drill pipe and the traveling block.

4,049,240

CONTINUOUS MIXER AND UNLOADER

Thomas Walters, Jr., Primos, Pa., assignor to Ecolaire Incorporated, Philadelphia, Pa.

Filed June 16, 1976, Ser. No. 696,464
Int. Cl.[2] B01F 9/06
U.S. Cl. 259—3 11 Claims



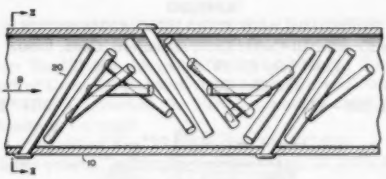
1. Apparatus for continuously mixing and unloading of particulate material and water comprising a conveyor, a support for said conveyor, a drum circumscribing said support and conveyor, said drum having an outlet providing communication between the conveyor and the interior of said drum, means for rotating said drum to cause material to flow from the conveyor to said drum outlet, a plurality of discrete blades in said drum adjacent to but spaced from said drum ID, means for supporting said blades so as to be stationary with respect to said drum, a water conduit in said drum, a plurality of nozzles on said conduit radially inwardly of and adjacent said blades, said blades being curved so as to direct material radially inwardly from the drum ID to a spray from said nozzles, and said blades being arranged along a helical path with the outer peripheral edge of said blades being adjacent to but spaced from the ID of said drum.

4,049,241

MOTIONLESS MIXING DEVICE

Toru Taniguchi, Tokyo, Japan, assignor to Reica Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1976, Ser. No. 650,547
Claims priority, application Japan, Jan. 21, 1975, 50-9413
Int. Cl.[2] B01F 15/02
U.S. Cl. 259—4 AC 6 Claims



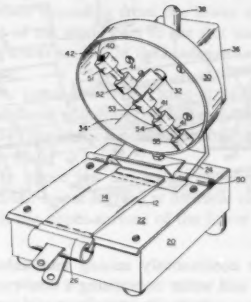
1. A motionless mixing device, comprising a hollow cylindrical housing for introducing a plurality of fluidic materials and a plurality of mixing elements of circular cross-section fixedly positioned within the housing, each of said mixing elements being inclined transversely of the longitudinal axis of the housing at a linear edge thereof in the direction of the flow of fluidic materials through the housing, one end of each of said mixing element in the radial direction of the housing being fixedly disposed in the inner wall of the housing and extending across and through the longitudinal axis of said cylindrical housing, said mixing element further having a space formed between another end of each said mixing element and the adjacent inner wall thereof so that the materials trapped by said element are permitted to pass therethrough.

4,049,242

MIXER FOR PRODUCTS CONTAINED IN SEALED ENVELOPES

John H. Porter, Colchester, Vt., assignor to Ladd Research Industries, Inc., Burlington, Vt.

Filed Apr. 19, 1976, Ser. No. 677,917
Int. Cl.[2] B01F 7/30
U.S. Cl. 259—72 **10 Claims**



1. In apparatus for mixing products contained in a flattened flexible package resting on a flat support by means of a roller assembly having a plurality of rollers urged toward the support as they rotate to press the package thereagainst, the rollers being aligned on an axis generally parallel to the support and orbiting a second axis generally perpendicular to the support, the apparatus having mechanism for rotating the roller assembly and support relatively to one another on said second axis to produce the rolling movement, the improvement

wherein the rolling surface of a centermost roller extends at least to said second axis to prevent accumulation of unmixed product thereat,

the remaining rollers extend radially outwardly from said axis in at least one direction to cover the area occupied by said package, and

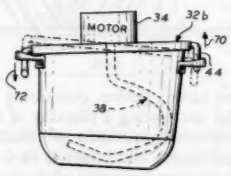
including means for maintaining at least some of said rollers out of pressure contact with package across at least a portion thereof during at least a portion of their orbital movement to cause mixing movement of product within the package for rapid and intimate mixing thereof and to prevent product entrapment at locations therein.

4,049,243

BLENDING AND KNEADING APPARATUS

Hyman Kramer, 50 Carter Drive, Stamford, Conn. 06902

Filed July 19, 1976, Ser. No. 706,752
Int. Cl.[2] B01F 7/16, 15/00
U.S. Cl. 259—122 **14 Claims**



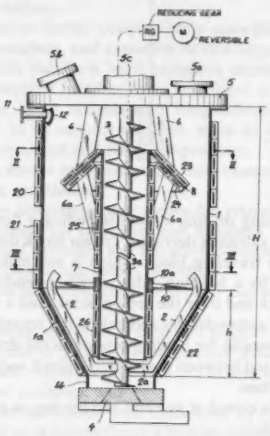
1. Apparatus for kneading ingredients into a mixture having an associated viscosity, comprising an open-topped container for said ingredients, support means capable of bridging the open top of the container, and interengaging means carried by the container and the support means for removably securing the support means on the container and for resisting forces tending to rotate the support means relative to the container, rotary drive means including an electric motor carried by said support means, and a kneader arm drivable by said drive means for rotation in the container about an axis of rotation, said kneader arm being supported solely at its upper end by said drive means and being otherwise free for movement relative to the container, said container having a bottom, said interengaging means and support means in combination comprising connection means between said container and said rotary drive means for enabling both rotation of said kneader arm about said axis of rotation and angular displacement of said axis of rotation with respect to said container bottom during said rotation for enabling the axis of rotation of the kneader arm to sweep over said container bottom during rotation of said kneader arm.

4,049,244

APPARATUS FOR THE HIGH-SPEED MIXING AND DEGASIFICATION OF VISCOUS MATERIALS ESPECIALLY SYNTHETIC RESIN

Wilhelm Hedrich, Katzenfurt, Germany, assignor to Firma Wilhelm Hedrich Vakuumanlagen, Katzenfurt, Germany

Filed Oct. 2, 1975, Ser. No. 618,923
Claims priority, application Germany, Dec. 3, 1974, 2457001
Int. Cl.[2] A21C 1/00; A23G 1/00; B01F 7/16; B01D 19/00
U.S. Cl. 259—185 **7 Claims**



1. An apparatus for mixing, degassing or thickening a composition comprising a plurality of reactive components, said apparatus comprising:

a substantially round upright vessel having a lower portion extending over about one third of the height of said vessel and converging downwardly to a cylindrical outlet;

a discharge valve at said outlet;

a cover hermetically to and removable from the top of said vessel;

a worm extending vertically in said vessel and journaled on said cover, said worm reaching downwardly into said cylindrical outlet and terminating just above said valve;

a fixed mixing tube closely surrounding said worm and opening at its upper and lower ends into the interior of said vessel;

a laterally and downwardly diverging apron at said upper end of said mixing tube whereby material induced to rise in said tube by rotation of said worm cascades over said apron in a thin layer;

means for evacuating said vessel;

agitating vanes on said worm extending along the wall of said lower portion for mixing material therein around the lower end of said tube; and

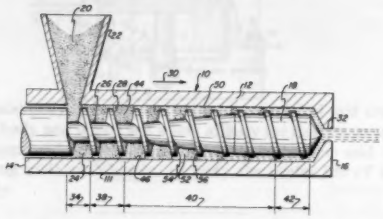
temperature-control elements distributed in sections along the walls of said vessel, said tube and said apron for controlling the temperature of material in said vessel.

4,049,245

APPARATUS AND METHOD FOR PREPARING A PLASTICATED MATERIAL

Zehev Tadmor, Haifa, Israel, and Imrich Klein, Highland Park, N.J., assignors to Scientific Process & Research, Inc., Highland Park, N.J.

Filed July 7, 1975, Ser. No. 593,432
Int. Cl.[2] B29B *3/00*; B29H *1/10*
U.S. Cl. 259—191 **15 Claims**



1. Apparatus for preparing a plasticated material from solids of a given material introduced into the apparatus, said apparatus comprising:

a barrel having an inner surface;

supply means for introducing said solids of a given material into the barrel;

a screw conveyor in the barrel, said screw conveyor including a flight which, together with the inner surface of the barrel, defines a channel for conveying the given material from the supply means in a downstream direction as the material is melted within the channel, said flight having a leading face facing downstream and a trailing face facing upstream, said channel having a predetermined width between confronting leading and trailing faces;

the channel including a solids conveying zone having a length extending between the supply means and a point where the temperature of the inner surface of the barrel is at the melting point of the given material, and a melting zone located downstream from the solids conveying zone; and

means on the screw conveyor, at the leading face of the flight, in the vicinity of said point where the temperature of the inner surface of the barrel is at the melting point of the given material for inducing the formation of a melt pool in the channel at a location downstream from the supply means a distance approximately equal to the length of the solids conveying zone, said melt pool inducing means having a configuration which effects a change in the width of the channel in at least that portion of the channel located in the vicinity of said point, said change in width being accompanied by so abrupt an increase in width at that portion as to form a void between the solids and the leading face of the flight to accommodate the melt pool at said location.

4,049,246

BUMPER GUARD FOR STEEL CONVERTING APPARATUS ENCLOSURE

Joseph Ziegler, Apollo, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Mar. 8, 1976, Ser. No. 664,533
Int. Cl.[2] C21C *5/28*
U.S. Cl. 266—158 **11 Claims**

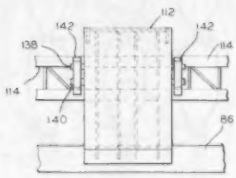
1. A stationary enclosure for a pivotally mounted metallurgical vessel, said enclosure including: a side wall and

an access opening formed in said enclosure whereby said vessel may be charged with metal from metal conveying means movable in a first direction toward said enclosure,

door means movably mounted relative to said opening for selectively closing the same,

support means,

arm means pivotally mounted on said support means for movement in said first direction, bumper means mounted adjacent said door means, said bumper means including shield means mounted on said arm means and having plate means provided with a first surface facing in a direction opposite to said first direction, said shield means having an initial position and being mounted for limited movement in said first direction as said arm means pivots,



and shock absorber means disposed adjacent said shield means and being positioned, constructed and arranged for resisting pivotal movement of said arm means in said first direction as a result of engagement of said plate means by said conveyer means,

said shock absorber means being operative for absorbing impact energy resulting from the engagement of said conveying means with said shield means and for yielding to permit movement of said shield means in said first direction and for restoring said shield means to an initial position.

4,049,247

EQUIPMENT FOR THE CONTINUOUS PNEUMATIC INTRODUCTION OF COAL DUST

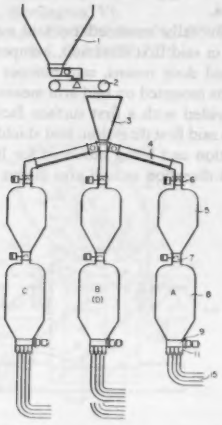
Walter Stamer, Hamburg, and Frithjof Eichinger, Buxtehude, both of Germany, assignors to Claudius Peters AG and MAX-PETERS Gesellschaft fur Verfahrenstechnik mbH, both of Hamburg, Germany

Filed Aug. 23, 1976, Ser. No. 717,005
Claims priority, application Germany, Aug. 22, 1975, 2537370
Int. Cl.[2] C21B *7/00*
U.S. Cl. 266—182 **5 Claims**

1. Equipment for the continuous, pneumatic introduction of finely divided materials, in particular coal dust, into several consumption sites, in particular into the tuyeres of blast-furnaces, characterized

by combining systems partly known per se in such manner that a plurality of double-story vessels is preceded by a distribution system consisting of a supply bin **(1)** with metering conveyor scale and distribution bin **(3)**, in that a pressure-resistant bucket-wheel distributor **(9)** is mounted underneath every pressure-vessel **(8)**, the buckets of said distributor being multiply subdivided **(10)** transversely to the axis, and in that a pressure-pan **(11)** provided with conveyor-gas hook-up **(13)** and subdivided into mini-

chambers (12) corresponding to the bucket-wheel distributor is mounted underneath each bucket-wheel distributor, the conveyor lines (15) to the consumption sites being connected to said pressure pan.



4,049,248

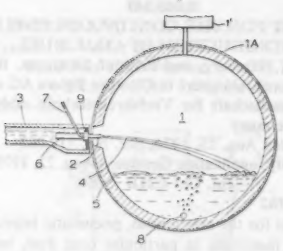
DYNAMIC VACUUM TREATMENT

Ole Georg Gjosteen; Trygve Olavson Terum, and Aksel Ola Aarflot, all of Sunndalsora, Norway, assignors to A/S Ardal og Sunndal Verk, Oslo, Norway

Division of Ser. No. 496,859, Aug. 12, 1974, Pat. No. 3,895,937, which is a continuation-in-part of Ser. No. 269,086, July 5, 1972, abandoned. This application Jan. 15, 1975, Ser. No. 541,273

Int. Cl.² C21C *1/00*

U.S. Cl. 266—202 **11 Claims**



1. Apparatus for use in the batch production of light metal alloys, said apparatus comprising a vacuum furnace with a vacuum chamber, said vacuum chamber having a completely closed bottom wall, means for evacuating said vacuum chamber, and nozzle means for introducing molten light metal into said vacuum chamber by suction, said nozzle means comprising at least one nozzle for forming at least one free-falling jet of molten light metal in said vacuum chamber, said at least one nozzle being directed into said vacuum chamber at an angle with the horizontal plane in the range of from 3° to 20°.

4,049,249

TILTABLE CONVERTER

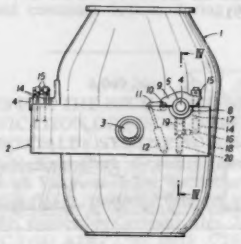
Peter Moser; Manfred Eysn; Bernhard Enkner; Rupert Berger, all of Linz; Wolfgang Wagner, Vienna, and Ronald Spannlang, Linz, all of Austria, assignors to Vereinigte Osterreichische Eisen - und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Dec. 9, 1975, Ser. No. 639,245

Claims priority, application Austria, Mar. 12, 1975, 1891/75

Int. Cl.² C21C *5/42*

U.S. Cl. 266—247 **8 Claims**



1. In a tiltable converter having a converter body, supporting trunnions fixed to the converter body, a bearing structure surrounding the converter body for at least half of its circumference, bearing bushings releasably connected to the bearing structure for mounting engagement of the supporting trunnions, and drawing hooks for attaching the bearing bushings to the bearing structure and being pivotable into and out of an engagement position, the improvement comprising:

a bearing bushing bolting piece for each bearing bushing, said bolting piece being arranged for engagement and disengagement with at least one drawing hook so as to attach the bearing bushings to the bearing structure or to release them, respectively, said at least one drawing hook having a hook end and a shaft end with an axis therebetween, each drawing hook being arranged on the bearing structure so as to be pivotable around said axis, the hook end of the at least one drawing hook being pivotable into engagement with the bearing bushing bolting piece;

at least a first pressure medium cylinder allocated to each bearing bushing for actuating the at least one drawing hook, said first pressure medium cylinder having one side articulately connected to the bearing structure; and

self-locking bracing means fastened to the bearing structure for releasably locking the at least one drawing hook in its engagement position, said self-locking bracing means includes a push rod for each drawing hook and a guide for the push rod, the shaft end of the drawing hook being hinged to one end of the push rod and the other end of the push rod being connected to the other end of the first pressure medium cylinder, the other end of the push rod also being guided in said guide and being movable along said guide into a locked position by means of said first pressure medium cylinder.

4,049,250

CRUCIBLE

Walter Schmidt, Schaffhausen, Switzerland, assignor to Prolizenz AG, Chur, Switzerland

Filed Feb. 26, 1976, Ser. No. 661,439

Claims priority, application Switzerland, Mar. 6, 1975, 2845/75

Int. Cl.² F27B *14/10*

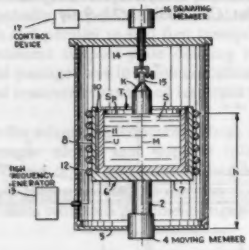
U.S. Cl. 266—275 **8 Claims**

1. A crucible for use with an oxidizing melt at elevated temperatures, comprising

a crucible body composed of a material selected from the group consisting of platinum metals and tungsten and

which is able to withstand the elevated melt temperatures but is subject to corrosion due to the oxidizing character of the melt; and

a continuous anti-corrosion coating on the inner surface of said crucible body, said coating being of a metal which is



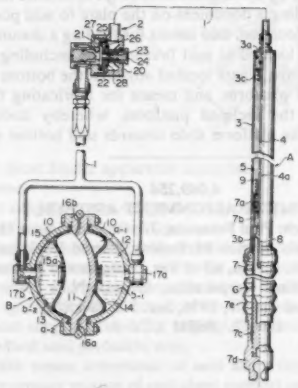
substantially non-alloying with the material of said crucible body and which has a low affinity for oxygen so as to protect said material of said crucible body from said oxidizing melt and thereby prolong the useful life of said body.

4,049,251

SHOCK ABSORBING STRUT ASSEMBLY

Watanabe Masae, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Dec. 11, 1975, Ser. No. 639,778
Claims priority, application Japan, Dec. 12, 1974, 49-142788
Int. Cl.² B60G *13/00*
U.S. Cl. 267—64 R **5 Claims**



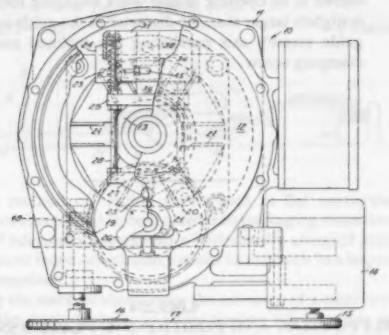
1. Shock absorbing oleo assembly which comprises telescopically extensible strut means defining therein oil chamber means of variable volume, pressure accumulator means, said accumulator means comprising a housing, said housing having a pair of oil compartments therein, each of said compartments being separated by a partition and each of said compartments being in communication without any restriction with said oil chamber means in the strut means, at least two separated gas compartments in said housing, a pair of pressure responsive wall means in said housing which separate the gas compartments from said oil compartments, and each of which is exposed to its respective oil compartment, said gas compartments being respectively charged at different gas pressures, means for holding the pressure responsive means in the gas compartment of higher pressure against movement when oil pressure in the oil chamber means is below a predetermined value so that the gas pressure in the gas compartment of the higher pressure does not have influence on the oil pressure.

4,049,252

INDEX TABLE

Theodore F. Bell, c/o Norbell Corp., 400 Fentress Blvd., Daytona Beach, Fla. 32014

Filed Feb. 4, 1976, Ser. No. 655,203
Int. Cl.² B23Q *1/04*
U.S. Cl. 269—57 **11 Claims**



1. In an index table, the combination comprising

a base,

a table mounted about an axis for rotation on the base,

means for indexing said table to bring successive points of said table into predetermined positions,

spaced locating means fixed on said table at circumferentially spaced points,

radial locking means on said base movable radially inwardly to engage said locating means and to lock said table relative to said base and movable radially outwardly to disengage said table from said base,

and means operable upon rotation of said table to move said radial locking means radially inwardly and outwardly,

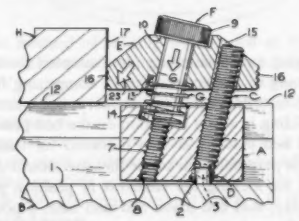
pump means operable upon radial movement of said radial locking means to provide oil under pressure for lubricating portions of said table.

4,049,253

TOE CLAMP

George I. Mandel, 4146 Krolop Road, Castro Valley, Calif. 94546

Filed Nov. 26, 1976, Ser. No. 745,042
Int. Cl.² B23Q *3/02*
U.S. Cl. 269—137 **3 Claims**



1. A toe clamp comprising:

a. a nut slidable in an elongated groove in a milling machine table top, the groove having a cross section in the shape of an inverted T;

b. a work engaging member having a bore downwardly

inclined from the vertical and facing toward the adjacent edge of a work piece supported by the table top;

c. a clamping screw having an upper portion received in said bore and a lower portion threaded into said nut, the head of said clamping screw moving said work engaging member downwardly and against the adjacent edge of the work piece when said clamping screw is tightened; and

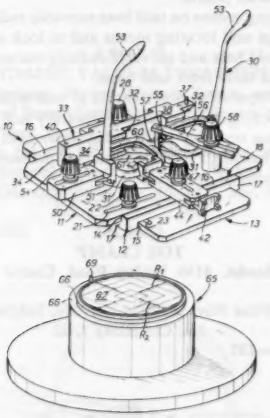
d. means for interconnecting said nut with said work engaging member and including a guide screw having its lower portion threaded into said nut and its upper portion received in an opening in said work engaging member that is slightly larger than the diameter of the guide screw, said guide screw's axis paralleling the inclined axis of said clamping screw.

4,049,254

SUPPORTING AND POSITIONING PLATE ASSEMBLY FOR SPECTACLE FRAMES

Jean Marie Godot, Brunoy, France, assignor to Essilor International Cie Generale d'Optique, France

Filed July 13, 1976, Ser. No. 704,790
Claims priority, application France, July 24, 1975, 75.23087
Int. Cl.[2] B25B 5/14
U.S. Cl. 269—156 **25 Claims**



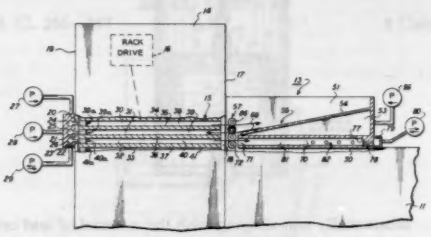
1. A supporting and positioning plate adapted for the controlled positioning of a spectacle frame, comprising fastening means adapted to hold a spectacle frame, a bed plate, a tray mounted for sliding in a first direction on the bed plate, a base on which said bed plate is in turn mounted for sliding in a second direction perpendicular to the first-mentioned direction locking means for locking the elements in position provided between said tray, said bed plate, and said base, a positioning pedestal, complementary engagement means being provided between the said pedestal and the base of the plate, and the base, bed plate, and tray being provided with mutually corresponding cavities which leave the upper face of the pedestal visible, and around which are disposed the associated spectacle frame fastening means, the upper face of the pedestal being provided with reference axes.

4,049,255

APPARATUS FOR FEEDING DOCUMENTS TO AND FROM A COPIER

Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 8, 1976, Ser. No. 664,603
Int. Cl.[2] B65H 5/22, 9/04
U.S. Cl. 271—3 **9 Claims**



1. Apparatus for posing documents on a transparent plate, comprising:

a. a rack having a plurality of pockets with aligned openings;

b. means for moving any pocket of the rack to a first location and to a second location;

c. fluidic means for drawing a document into any pocket stationed at said first location;

d. fluidic means for selectively ejecting or drawing into any pocket stationed at said second location a document; and

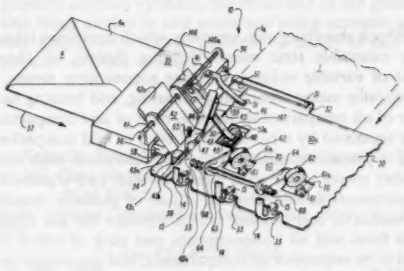
e. a document handler including means for feeding a document to any pocket located at said first location, and means cooperating with the plate for moving a document ejected from a pocket at the second location onto the plate and for feeding a document on the plate to said pocket at the second location, said means for feeding a document to any pocket located at said first location including an inclined platform, a gate located adjacent the bottom end of the inclined platform, and means for lubricating the top surface of the inclined platform, whereby documents placed on the platform slide towards said bottom end.

4,049,256

DOCUMENT ALIGNMENT ASSEMBLY

John Allen Church; Paul Feinstein, Jr.; Ronald Eugene Hunt, all of Austin; Louis Marion McDaniels, Round Rock, and Paul Francis Munch, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 7, 1976, Ser. No. 693,820
Int. Cl.[2] B65H 5/26, 9/16
U.S. Cl. 271—9 **7 Claims**



1. Alignment apparatus for aligning separate sets of documents wherein at least one of said sets includes documents such as conventional envelopes, said apparatus disposed at the inter-

section of transversely oriented first and second transport paths along which said sets of documents are respectively transported for aligning respective ones of said documents in a document engaging means of a transport assembly with said document engaging means positioned substantially perpendicular to said first one of said transport paths, comprising:

a. document guide edge means disposed in an orientation substantially perpendicular to said document engaging means and parallel to said first transport path;

b. a document support plate defining respective first and second passageways in communication with said first and second transversely oriented transport paths, respectively; and

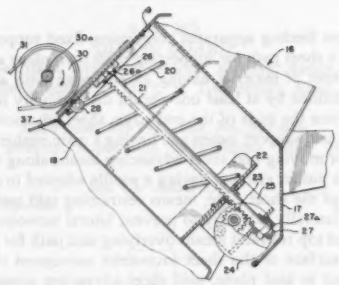
c. means for advancing a document from either of said sets of documents along said support plate simultaneously toward said document guide edge means and said document engaging means, thereby to accurately align said documents with said document engaging means.

4,049,257

DOCUMENT FEEDER APPARATUS

Richard Frystak, Park Ridge, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 4, 1976, Ser. No. 683,112
Int. Cl.² B65H *1/12, 1/18, 3/52*
U.S. Cl. 271—114 **10 Claims**



1. A sheet feeder apparatus comprising:

a frame;

sheet support means adapted to support a stack of sheets and moveable within said frame;

a pivotable arm mounted on said frame for engaging the stack of sheets, said pivotable arm normally in a first position and being moveable to a second position;

coil spring drive means operatively associated with said sheet support means for urging said sheet support means toward said pivotable arm;

a brake means connected to said sheet support means for preventing motion of said sheet support means within said frame toward said pivotable arm means, said brake means comprising:

rack means connected at one end thereof to said sheet support means;

pinion means engaging said rack means;

an electric motor connected to said pinion means, said electric motor having sufficiently high torque when inoperative to overcome said coil spring drive means urging of said sheet support means toward said pivotable arm when said pivotable arm is in said second position; and

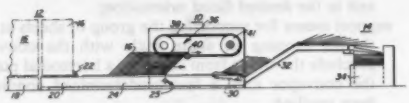
a switch for operating said brake means, said switch being closed when said pivotable arm means is in said first position and open when said pivotable arm is in said second position, whereby said sheet support means may be depressed within said frame and loaded with a stack of documents which is urged by said coil spring drive means toward and into engagement with said pivotable arm means for feeding, which pivots said pivotable arm from said first position into second position thereby to activate said brake means until a portion of the sheets are fed and said pivotable arm pivots again to said first position.

4,049,258

METHOD OF AND APPARATUS FOR FEEDING SHEETS

Joseph A. Zeblisky, Jersey City, N.J., assignor to General Corrugated Machinery Co., Inc., Palisades Park, N.J.

Filed Aug. 4, 1976, Ser. No. 711,617
Int. Cl.² B65H *1/30*
U.S. Cl. 271—151 **4 Claims**



1. The method of feeding sheets such as flat corrugated paperboard sheets used to be formed into packaging cases from a stack of horizontal sheets into a horizontally shingled array of the desired faced orientation toward an exit such as a hopper which comprises:

feeding the stack of sheets onto the entrance of a conveyor;

tilting the stack of sheets to a first posture wherein they are not yet in the horizontally shingled array, but are resting on their edges with the faces of the sheets and the conveyor forming an acute angle facing the exit;

supporting the face of the sheet in the stack closest to the exit such that all the sheets resting on their edges are supported in the first posture to thereby maintain the acute angle facing the exit;

moving the sheets while supported on their edges in the first posture toward the exit; and

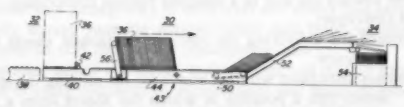
subsequently dropping the sheets from the first posture and into a second posture wherein the sheets are in the horizontally shingled array on the conveyor shingled toward the exit to thereby deliver them to the exit.

4,049,259

METHOD OF AND APPARATUS FOR FEEDING SHEETS

George A. Ventz, Clifton, N.J., assignor to General Corrugated Machinery Co., Inc., Palisades Park, N.J.

Filed Aug. 4, 1976, Ser. No. 711,479
Int. Cl.² B65H *1/30*
U.S. Cl. 271—151 **32 Claims**



1. The method of feeding sheets such as flat corrugated, paperboard sheets used to be formed into packaging cases from a stack of horizontal sheets into a horizontally shingled array of the desired faced orientation toward an exit such as a hopper which comprises:

feeding the stack of sheets onto the entrance of a conveyor;

tilting the stack of sheets to a first posture wherein they are resting on their edges so that the sheets form an acute angle with the conveyor, but are not in the horizontally shingled array;

supporting the face of the sheet in the stack which makes the acute angle with the conveyor to thereby support all the sheets on their edges in the first posture;

moving the sheets while supported on their edges in the first posture toward the exit; and

subsequently dropping the sheets from the first posture and into a second posture wherein the sheets are in the hori-

zontally shingled array on the conveyor shingled toward the exit to thereby deliver them to the exit.

5. Apparatus having an entrance and an exit for feeding a stack of horizontal sheets to deliver the same toward the exit in a shingled fashion comprising:

a conveyor;

means for delivering the stack of horizontal sheets to the entrance and onto the conveyor;

means associated with the conveyor for moving the stack of horizontal sheets into a position in which the sheets form a group resting on the edges of the sheets and wherein one end of the group of sheets forms an acute angle with the conveyor such that the sheets forms an acute angle with the conveyor such that the sheets will be delivered to the exit in the desired faced orientation;

support means for supporting the group of sheets at the end thereof forming an acute angle with the conveyor to preclude the sheets from falling to a horizontal posture on the conveyor until a first predetermined condition has been reached;

moving means for moving the support means toward and away from the exit;

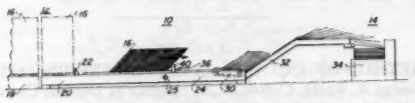
actuating means for actuating the moving means to move the support means toward the exit when the first predetermined condition has been reached to thereby move the group of sheets to a position wherein its leading sheet rests against the trailing sheet of the previous group and for actuating the moving means to move the support means toward the entrance when a second predetermined condition has been reached to await delivery of the next stack of horizontal sheets.

4,049,260

APPARATUS FOR FEEDING SHEETS

Andrew M. Szymborski, Mountainside, N.J., assignor to General Corrugated Machinery Co., Inc., Palisades Park, N.J.

Filed Aug. 4, 1976, Ser. No. 711,480
Int. Cl.² B65H *1/30*
U.S. Cl. 271—151 **6 Claims**



1. Apparatus having an entrance and an exit for receiving a stack of horizontal sheets such as flat, corrugated paperboard sheets at the entrance and feeding them to thereby deliver the same toward the exit in a shingled fashion comprising:

a conveyor;

means for delivering the stack of horizontal sheets to the conveyor;

means associated with the conveyor for moving the stack of sheets into a position in which the sheets form a group resting on the edges of the sheets and wherein the faces of the group of sheets and the conveyor form an acute angle facing the exit such that the sheets will be delivered to the exit in the desired faced orientation;

support means for supporting the group of sheets at the leading end of the group to preclude the sheets from falling to a horizontal posture onto the conveyor until a first predetermined condition has been reached, said support means being movable between a first position when it is below the level of the conveyor and the sheets are free to drop onto the conveyor and a second position when it is above the level of the conveyor and supports the sheets on their edges;

moving means for moving the support means toward and away from the exit;

actuating means for actuating the moving means to move the support means toward the exit while supporting the sheets on their edges when a second predetermined condition has been reached and for actuating the moving means to move the support means toward the entrance below the level of the conveyor when the first predetermined condition has been reached;

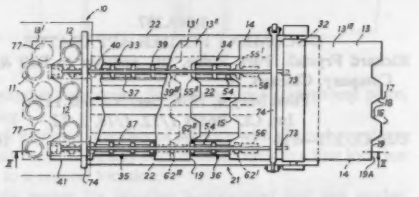
the leading sheet resting against the trailing sheet of the previous group when the first predetermined condition has been reached.

4,049,261

FEEDER FOR FEEDING SHEETS HAVING A RECESSED PROFILE END EDGE

Jozef Tadeusz Franek, Chorleywood, and Paul Porucznik, St. Albans, both of England, assignors to Metal Box Limited, England

Filed Aug. 30, 1976, Ser. No. 718,816
Int. Cl.² B65H *9/10*
U.S. Cl. 271—269 **7 Claims**



1. Sheet feeding apparatus comprising fixed support means defining a sheet path for supporting in its own plane along said path a sheet of material having an end edge with a recessed profile defined by at least one abrupt discontinuity intermediate between the ends of the end edge; sheet-advancing means adjacent said support means and having a main pusher element; means for moving said sheet-advancing means along said path, said main pusher element having a profile adapted to engage in a recess of the sheet edge; means restraining said main pusher element laterally whereby to prevent lateral movement of the sheet; and top restraint means overlying said path for engaging the top surface of the sheet to restrict movement thereof to movement in said plane, said sheet-advancing means having steadying means for engaging the sheet end edge so that, by virtue only of said steadying means engaging the sheet end edge, the sheet is prevented from slewing away at an angle with said path in said plane, said steadying means comprising an auxiliary pusher element spaced from said main pusher element in a direction having a component transverse to said path, said auxiliary pusher element having a transverse sheet-engaging face but being free of any non-transverse sheet engaging face, whereby the sheet is located transversely of said path by said main pusher element only, said sheet-advancing means further comprising means for moving said main and auxiliary pusher elements simultaneously and in parallel paths.

4,049,262

USER-ACTUATED SIMULATED MOTORCYCLE RIDE

Jere P. Cunningham, Jr., 1190 Central Ave., Memphis, Tenn. 38104

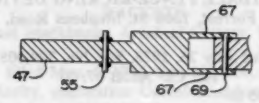
Filed Apr. 14, 1976, Ser. No. 677,019
Int. Cl.² A63G *31/00*; G09B *9/04*
U.S. Cl. 272—1 R **10 Claims**

1. A user-activated device for simulating the ride of a motorcycle, said user-activated device comprising:

a. base means for being supported on a supporting surface;

b. body means having a shape substantially similar to a motorcycle for supporting the user of said user-activated device, said body means having an elongated slot provided substantially transversely through said body means and extending substantially lengthwise of said body means with the midportion of said slot higher than either end thereof; and

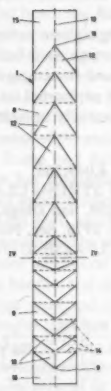
c. attachment means for movably attaching said body means to said base means, said attachment means including a substantially inverted U-shaped guide member having a normally horizontally extending midportion for extending substantially transversely through said slot of said body means and including a normally vertically extending end portion extending from each end of said midportion, said attachment means including resilient supporting means for movably and resiliently attaching said vertically extending end portions to said base means to thereby movably attach said body means to said base means for allowing the user of said user-activated device to selectively rotate said body means a limited amount and to selectively move said body means up and down a limited amount and back and forth a limited amount thereby allowing the user of said user-activated device to selectively cause said user-activated device to simulate the ride of a motorcycle, said attachment means normally providing the sole support of said body means above said base means.



4,049,263
DIVING BOARD

Dirk J. Gerritsen, Eext, and Marcus Kuipers, Annen, both of Netherlands, assignors to N. V. Tramposafe, Eext, Netherlands

Filed Mar. 18, 1975, Ser. No. 559,646
Claims priority, application Netherlands, Mar. 18, 1974, 7403632
Int. Cl.² A63B 5/10
U.S. Cl. 272—66 6 Claims



1. A diving board for a swimming pool, said diving board being of the cantilever type adapted to have its rear end attached to a stationary support and adapted to rest on an adjustable fulcrum at a fulcrum area between its front and rear ends, said diving board comprising a primary layer substantially extending over its full length, said layer having a low density and an upper surface and a lower surface, at least one of said surfaces being provided with a stack of flat layers of reinforcing material over at least a portion of said surface at both sides of said fulcrum area, said layers of reinforcing material including wire-sheet, the length of each of said wire-sheet layers of said stack successively diminishing from the front end and the rear end of the diving board towards the most rearward portion of the fulcrum area, said wire-sheet layers being bonded to one another and to said surface of the primary layer by a binding material.

4,049,264
LOOP-THE-HOOP EXERCISER

Cressie E. Holcombe, Jr., 1613 Blackwood Drive, Knoxville, Tenn. 37921

Filed Feb. 2, 1976, Ser. No. 654,582
Int. Cl.² A63B 5/20
U.S. Cl. 272—74 5 Claims

1. An exercising unit to be fastened to a user's body for orbiting a rigid circular hoop over and under the body during jumping actions while pivoting said hoop about a portion thereof maintained at a fixed point relative to the body, this oribiting being substantially without benefit of arm or hand manipulations, which comprises:

a base plate to fit against the body of a user;

means associated with said base plate to attach said base plate to said user's body;

a single beam extending substantially perpendicular to said base plate with a first end of said beam fastened to said base plate;

a cylindrical housing member rigidly attached to a second end of said beam, said housing member being provided with a transverse cylindrical open passageway having an axis substantially horizontal when said exercising unit is in use;

a rigid circular hoop member threaded through said passageway, said hoop member having a circular cross section less than the diameter of said passageway and a major diameter dimension sufficient to permit a portion of said hoop member diametrically opposite from a hoop portion within said passageway to orbit over and under said user's body during jumping actions while said hoop member pivots on said axis of said passageway; and

connecting means associated with at least one of said hoop and housing members to interconnect said hoop member with said housing member for rotation therebetween.

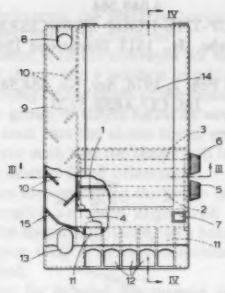
4,049,265
QUESTION AND ANSWER GAME

Thomas Barnet Mackie, Kirkcaldy, Scotland, assignor to Thomas Salter Limited, Kirkcaldy, Scotland

Filed May 5, 1976, Ser. No. 683,626
Claims priority, application United Kingdom, Oct. 29, 1975, 44588/75
Int. Cl.² G09B 3/00
U.S. Cl. 273—1 R 7 Claims

6. A toy for playing a question and answer game, comprising a housing having a ball inlet therein at the upper end thereof and a plurality of ball outlets at the lower end thereof, an intermediate chamber arranged in said housing, an inlet channel arranged along one side of said housing for guiding a ball placed in said ball inlet to said intermediate chamber, a plurality of baffle means arranged in said inlet channel, a plurality of

exit channels, each of said exit channels being associated with one of said outlets, a flexible belt having a plurality of ball passageways therethrough, each passageway corresponding to one of said exit channels, and two spindles within the housing,



attached to opposite ends of said flexible belt, each spindle including a turning knob on an end thereof external to said housing, whereby a ball passageway can be shifted selectively into communication with an exit channel.

4,049,266

SPORT PRACTICE APPARATUS

Robert J. Feiler, 2 Oriole Place, Portchester, N.Y. 10573

Division of Ser. No. 537,678, Dec. 30, 1974, Pat. No. 3,948,517.
This application Jan. 23, 1976, Ser. No. 651,678
Int. Cl.[2] A63B *61/00*
U.S. Cl. 273—29 A **4 Claims**

1. An apparatus for practicing strokes comprising:

a substantially vertical upstanding support member having a base;

a substantially horizontal second support member; means adjustably mounting said second support member to said upstanding first member adjacent the upper end thereof;

an elongated wire;

said wire having means rotatably attaching one of its ends to said second support member adjacent the outer free end thereof, such that said wire is rotatable about the longitudinal axis of said second support member in a vertical plane;

a ball;

said ball being mounted on the other end of said wire and being suspended below said second support member whereby being struck on the exercise of a stroke will cause said ball and wire to travel in said vertical plane around the longitudinal axis of said second support member;

a guide member;

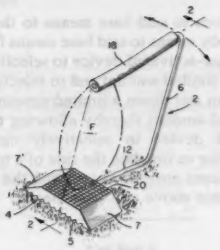
said guide member being a pair of elongated resilient arms, each of said arms being attached to said second support member and extending substantially verically upwards therefrom, one of said arms being positioned on one side of said vertical plane of travel of said ball and wire and the other arm being positioned on the opposite side of said second vertical plane of travel of said ball and wire, the upper end of each of said arms being bent towards said second vertical plane of travel to define a path through which said wire may pass when said ball is struck, whereby when said ball is hit correctly said wire will travel through said path without touching said arms and if said ball is hit incorrectly at least one of said arms will be touched by said wire.

4,049,267

FOOTBALL PLACE-KICKING DEVICE

Charles Phelps Forrest, 1306 St. Stephens Road, Mobile, Ala. 36603

Filed July 26, 1976, Ser. No. 709,005
Int. Cl.[2] A63B *67/00*
U.S. Cl. 273—55 B **8 Claims**



1. A football place-kicking device comprising:

a. a base adapted to support the lower end of a football;

b. an upright arm mounted on said base for pivotal movement in a vertical plane relative to said base;

c. a rigid upper arm and a rigid lower arm, each having one of its ends attached to said upright arm and each extending substantially horizontally from said upright arm, said lower arm portion having its other end frictionally attached to said base so as to allow said upright arm to pivot in a vertical plane; and

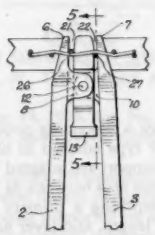
d. a semi-rigid ball-engaging arm mounted on the other end of said upper arm portion, said ball-engaging arm being adapted to be deformed for engagement with the upper end of a football when supported on said base, for holding said footall in a substantially upright position.

4,049,268

RACKET STRING CLAMP

Lynn L. Ray, P.O. Box 4034, San Diego, Calif. 92104

Filed Dec. 20, 1976, Ser. No. 752,035
Int. Cl.[2] A63B *51/14*
U.S. Cl. 273—73 A **9 Claims**



1. In the stringing of a racket, a clamping device for holding the tension of a string by attaching said string to an adjacent string which comprises:

two levers each having at one end a substantially flat clamping jaw; means for rockingly linking said levers

together near said clamping jaws;

resilient means for closing said clamping jaws; and spacer means operatively associated with said linking means so as to be floatingly held between said clamping jaws so that a pair of adjacent parallel strings can be held between said spacer means and respective ones of said clamping jaws.

4,049,269

RACKETS

Robin Michael Blackburne, Ardsheal Cottage, Paget 6-20, Bermuda

Filed Mar. 6, 1975, Ser. No. 556,188

Claims priority, application United Kingdom, Mar. 6, 1974, 10120/74; May 31, 1974, 24294/74

Int. Cl.[2] A63B *51/06*

U.S. Cl. 273—73 D 9 Claims

1. A games racket comprising a handle intended to be held in the hand, and carrying a head having an open marginal frame defining a central opening, across which extends tensioned stringing carried by the head, the stringing being composed of a first group of generally parallel string portions, and a second group of generally parallel string portions extending generally perpendicular to, and interwoven with, the string portions of the first group, the thickness of the frame in a direction generally normal to the plane of the stringing being substantially greater than the thickness of the stringing, the frame including a structural marginal frame part defining the central opening, and a separate flexible but substantially incompressible, elongate member having an upper portion and a lower portion and formed from a relatively hard synthetic plastics material, extending substantially continuously, at least from one side of the handle, around the outer peripheral surface of said frame part to the other side of the handle, and overlying said outer peripheral surface, said frame part and said lower portion of the elongate member having at least one interfitting projection and recess, said elongate member being formed with a plurality of stringing-receiving apertures distributed around a major proportion of the peripheral extent of the frame, said apertures being spaced from the outer periphery of said upper portion of the elongate member, and extending continuously between and opening into, opposite side surfaces of said elongate member which are spaced apart in said direction, said elongate member, in the zones thereof provided with said apertures, having a thickness in said direction approximating the thickness of said frame part, and at least the outer peripheral surface of said upper portion of the elongate member, over substantially its entire length, being relatively smooth, uninterrupted, and devoid of projections, said tensioned stringing carried by the head passing through said apertures, and being disposed in two generally parallel planes separated by a distance approximating the thickness of the frame in said direction.

4,049,270

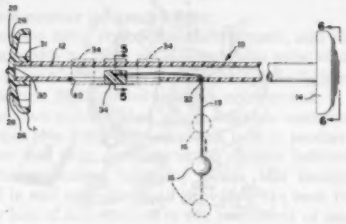
TETHERED BALL AND SHAFT GAME DEVICE

Adrian W. McCall, 80 Gaywood Place, Moraga, Calif. 94556, and William L. Kellogg, 2912 Bayview Drive, Alameda, Calif. 94501

Filed Apr. 22, 1976, Ser. No. 679,154

Int. Cl.[2] A63B *67/00*

U.S. Cl. 273—95 A 4 Claims



4. A ball and staff game device comprising: an elongated staff with distally spaced opposite ends; a pair of enlarged end pads connected to the opposite ends of the staff for horizontal support of the staff; a line of predetermined length having first and second ends; a ball, wherein the first end of the line is connected to said ball and the second end of the line is connected to said staff, said line having a substantial segment pendant from the staff approximately midpoint along the staff; and, a line adjustment means connected to said second end of the line for adjusting the length of the segment of line pendant from the staff, wherein said staff comprises a hollow tube, said tube having a longitudinal slot along a portion of said staff and an aperture proximately displaced from said slot, and wherein said line adjustment means includes a stop mechanism engageable with said slot and moveable with respect to said slot to a plurality of positions on said slot said line being connected to said stop mechanism and passed through said hollow tube and out said aperture.

4,049,271

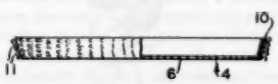
TARGET BOARD SAIL GAME

Richard A. Fonti, 11 Beckford St., Beverly, Mass. 01915

Filed Aug. 9, 1976, Ser. No. 712,756

Int. Cl.[2] A63B *65/10, 67/06*

U.S. Cl. 273—95 R 3 Claims

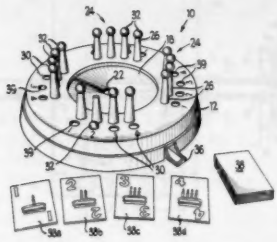


1. In a game comprising a planar target board having a fibrous surface with appropriate scoring designations thereon, a missile adapted for sailing toward and adherence to said board including a circular disc portion, a circular peripheral rim formed integrally with and extending at an angle from and completely around the circumferance of said disc portion, said rim being positioned asymmetrically with respect to the plane of said disc portion, and a strip of fabric hook tape secured to and extending around the outer surface of said rim.

4,049,272
GAME DEVICE

Jeffrey D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 13, 1976, Ser. No. 658,025
Int. Cl.[2] A63F 9/14
U.S. Cl. 273—95 R 7 Claims



1. A game apparatus, comprising:
a base support;
a plurality of playing objects coded for use by multiple players of the game;
means on said base support defining a receptacle for determining the first of said playing objects to be received therein;
a plurality of playing positions on said base support about said receptacle;
a plurality of upstanding standards at each playing position for positioning on top thereof a plurality of said coded playing objects; and
said objects being of a physical character so as to be capable of being blown off of its respective standard by the air exhalation by players of the game from the top of the standards toward the receptacle.

4,049,273
LACROSS STICK AND PREFORMED NETTING THEREFOR

Robert B. Pool, 564 Charleston Road, Willingboro, N.J. 08046

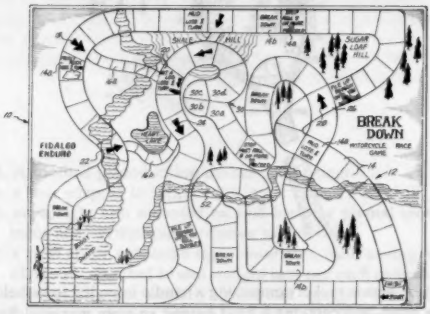
Continuation of Ser. No. 347,709, April 4, 1973, abandoned. This application Mar. 26, 1975, Ser. No. 562,217
Int. Cl.[2] A63B 59/02
U.S. Cl. 273—96 D 4 Claims

1. The unassembled combination of a lacrosse stick head comprising a V-shaped frame and a separate preformed netting adapted to extend throughout the area within the boundaries of said frame; said frame having a pair of diverging side walls joined at a jointure and an outer end member connecting the outer ends of the side wall members to form a closed net area of substantially triangular form, said netting being of elongated form having one end of the netting of substantially the same width as the inside edges of the frame at the outer end of the sidewall members and the remaining portion of the net of greater width than the remaining portion of the net area extending between the sidewall members toward the juncture of the two side walls of the frame and means for tightly lacing the edge of the above mentioned end of the netting to the outer end member and the outer ends of the side walls and means for attaching the edge of the remainder of the netting to the remaining portions of the diverging side walls of the frame to a point adjacent the juncture of the side wall members, thereby automatically forming a pocket in the netting adjacent the jointure of the two side wall members when the head and netting are assembled.

4,049,274
MOTORCYCLE TEAM RACING GAME

Cecil F. Jevons, 2706 J Ave., Anacortes, Wash. 98221

Filed Mar. 4, 1976, Ser. No. 663,778
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—134 CA 12 Claims



1. A game to simulate team racing, such as cross-country motorcycle team racing, where each player is able to operate selectively members of the player's team along a race course, while maintaining a predetermined order of the team members, with an element of chance to simulate delays and hazards of racing, and with elements of strategy by which the player can attempt to maximize progress of the player's own team members and minimize progress of team members of another player, said game comprising:

a. a board having a representation of an obstacle encumbered race course, such as a cross-country motorcycle course, said race course being divided along its length into increments of travel, such as squares,

b. a plurality of sets of markers, such as figures of a motorcycle team, each set having identification means, such as a color coding, to identify the markers of that set belonging to a particular player,

c. said board having turn delay indicating means, such as breakdown squares, natural hazard squares or racing obstacle squares, to indicate a delay in progress of a marker encountering the delay indicating means by loss of one or more turns,

d. chance means, such as dice, operable by a player to provide by chance a numerical value to determine the extent of progress of a selected marker along said race course, and

e. a plurality of sets of turn delay counters, such as breakdown counters, said sets of counters corresponding to related sets of markers, with each set of counters having an individual counter for each marker of its related set of markers, so that as play progresses, it is possible to count off the number of turns that are lost as a result of a marker encountering said delay indicating means, and to associate

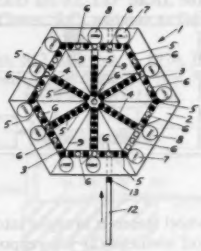
the delay in turns with a particular marker of a particular player.

4,049,275

BOARD GAME APPARATUS

Carl W. Skelton, 1105 Running Brook Drive, Shreveport, La. 71108

Filed Sept. 23, 1976, Ser. No. 725,848
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—134 AE **10 Claims**



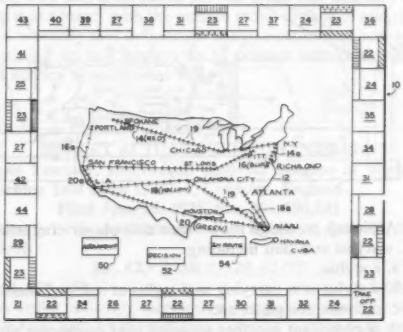
1. A board game apparatus comprising:
a. a game board having marked spaces constituting a track extending about said game board to define a prescribed route of traversal of said game board;
b. at least one slot in said game board beneath selected ones of said marked spaces on said game board;
c. a plurality of player tokens, each containing a magnet, for traversing said path or track; and
d. a plurality of challenge sticks, each containing a magnet in one end thereof, for insertion in said at least one slot for magnetically influencing said magnet in said player tokens when said player tokens are on said selected ones of said marked spaces.

4,049,276

BOARD GAME APPARATUS

Richard A. Hole, 3850 Abbotsford Road, Rockford, Ill. 61107

Filed Sept. 27, 1976, Ser. No. 727,244
Int. Cl.[2] A63F *3/04*
U.S. Cl. 273—134 AC **6 Claims**



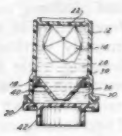
1. A game for at least two players comprising in combination:
a. a game board displaying a geographical area with a plurality of locations connected by color coded airplane flight routes, an equal number of checkpoints being provided on each flight route, a similarly color coded alternate flight route being additionally provided for each said flight route, checkpoints in turn being provided for each alternate flight route;
b. a strip provided on said game board along its border edges, said strip being divided into a plurality of individual units, a number inscribed in each unit, said number corresponding to a predetermined set of instructions as set forth in a legendary table therefor, a minority of said units being randomly color coded consistent with the color coding of said airplane flight routes, each color being represented equally;
c. a chance number indicator means;
d. at least two color coded miniature aircraft, said aircraft being movable between checkpoints from point of departure to point of destination along said airplane flight routes and alternate flight routes similarly color coded;
e. at least two color coded board markers, said markers being movable from one individual unit to another provided on said strip, pursuant to the number indicated by said chance number indicator means, said number inscribed in said individual unit providing the basis for the gain or loss of score points or the movement of said aircraft between checkpoints in accordance with the instructions set forth in said legendary table; and
f. a first set of a plurality of cards designated as Airmanship Cards and relating solely to the gain or loss of score points; a second set of a plurality of cards designated as Decision Cards and relating to the gain or loss of score points or the movement of said aircraft between checkpoints; a third set of a plurality of cards designated as Enroute Cards and relating to the gain or loss of score points or the movement of said aircraft between checkpoints, said first, second, and third set of cards being selectable in accordance with the instructions set forth in said legendary table.

4,049,277

BUBBLE FREE DIE AGITATOR

Ernest R. Carlsson, Jr., Huntington; Henry Delach, Bethpage, and Henry Hinz, Huntington, all of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Sept. 4, 1975, Ser. No. 610,355
Int. Cl.[2] A63F *9/04*; B65D *1/04*
U.S. Cl. 273—145 C **6 Claims**



1. A die agitating amusement device comprising, a closed liquid tight container having opposed first and second end portions, said second end portion having a substantially flat transparent section therein; a liquid impervious partition member in said container located adjacent said first end portion thereof, said partition extending across the entire crossection of said container thereby dividing the container into first and second chambers, with the first chamber being of greater volume than the second chamber and located between the second end portion of the container and said partition; said second chamber being located opposite said first chamber between said partition and said first end portion of the container, said partition member having a centrally located extension portion which extends into said second chamber towards said first end portion of the container and an opening in said extension portion providing the sole fluid communication between said chambers, an opaque liquid filling said first chamber and a portion of said second chamber, the volume of liquid

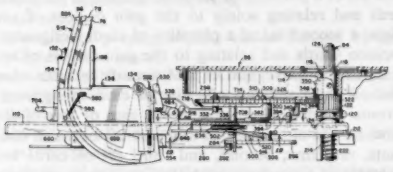
in said container being selected to entirely fill said first chamber and a portion of the second chamber to keep said opening immersed in liquid regardless of the position of the container whereby any air in said second chamber accommodates expansion of the liquid while the first chamber remains completely filled with liquid and any gas bubble defined by such air remains trapped in the container in said second chamber upon tilting or inversion of the container; and a buoyant die member located in said first chamber and having indicia formed thereon in a color contrasting with the color of said liquid whereby said indicia can be read through said second end portion of the container when said second end portion is above said first end portion but said buoyant member is blocked by said partition when said first end portion is above said second end portion.

4,049,278

AUTOMATIC RECORD CHANGER

James T. Dennis, 3900 SE. 29th St., Oklahoma City, Okla. 73115

Filed Jan. 9, 1974, Ser. No. 432,089
Int. Cl.[2] G11B *17/16*
U.S. Cl. 274—10 R **14 Claims**



1. In an automatic record changer, a rotatable turntable, means for rotating said turntable, a record supporting spindle positioned at the center of said turntable for supporting records having a relatively small centering aperture, said spindle having means defining a record supporting shelf on which a stack of small centering aperture records may be placed, a record supporting platform positioned to support the edge of the bottom record of a stack of records seated on said shelf, means for ejecting the bottom record of a stack of records seated on said shelf and supported on said platform, a record hold down member arranged to engage the top record of a stack of records supported on said platform, and at last record sensing member operable independently of said hold down member and movable in a generally vertical plane, means operable during the record changing cycle for moving said sensing member into engagement with the outer edge of a record held on said platform by said hold down member, and means responsive to inward of said sensing member when no record is positioned on said platform for de-energizing said turntable rotating means.

4,049,279

CONTROL DEVICES FOR PICK-UP ARMS OF RECORD PLAYERS

Gustav Kleis, Lahr, Germany, assignor to Geratewerk Lahr GmbH, Lahr, Germany

Filed Oct. 20, 1976, Ser. No. 734,132
Claims priority, application Germany, Oct. 20, 1975, 2546921
Int. Cl.[2] G11B *17/06*
U.S. Cl. 274—15 R **16 Claims**

1. A control device for a pick-up arm of a record player, said device comprising:

a. a power take-off element **(2)** disposed on a vertical spindle of a pick-up arm;

b. a shaft of rotation;

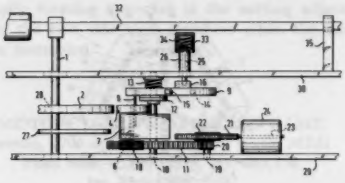
c. a sun wheel mounted on said shaft for rotation therewith;

d. drive means for rotating said sun wheel;

e. a rotatable support means consisting of an element and a bar non-rotatably connected to each other with said bar being mounted on said shaft and rotatable independently thereof;

f. a clutch mounted on said shaft and connecting said element to said shaft to rotation therewith and thereby serving to rotate said bar with said element;

g. at least one planet wheel means in engagement with said sun wheel **(11)** and mounted to said rotatable support means about said shaft of rotation whereby, on rotation of said sun wheel **(11)**, said rotatable support means with said planet wheel means mounted thereon will also rotate until



said planet wheel means is brought into contact with said power take-off element **(2)** whereupon said clutch **(12)** will slip and said planet wheel means will rotate about its said axis of rotation and, through frictional contact with said power take-off element **(2)**, will rotate said vertical spindle and thus swivel said pick-up arm; and

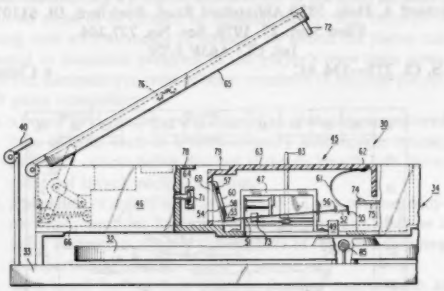
h. lifting means responsive to said rotation of said rotatable support means to raise said pick-up arm before said planet wheel means is brought into contact with said power take-off element.

4,049,280

PICKUP CARTRIDGE

Marvin Allan Leedom, South Brunswick Township, Middlesex County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 16, 1976, Ser. No. 667,308
Claims priority, application United Kingdom, Sept. 18, 1975, 38458/75; Nov. 28, 1975, 49109/75
Int. Cl.[2] G11B *3/02*
U.S. Cl. 274—37 **11 Claims**



1. A pickup cartridge for a video disc player comprising:

A. a stylus arm unit including:

a. a stylus;

b. a stylus arm carrying said stylus at one end therof;

c. a connector plate; and

d. a compliant member securing said connector plate to the other end of said stylus arm;

B. a cartridge having walls defining a protective enclosure for said stylus arm unit; and

C. means, including a flexible diaphragm secured to said connector plate, for flexibly suspending said connector plate within said cartridge at a first angular orientation with respect to said cartridge such that said compliant member is unstressed when said stylus arm occupies a

retracted position within the confines of said cartridge while said connector plate is held in said first angular orientation;

said connector plate being adapted to be rotated when said cartridge is mounted in said player to a second angular orientation such that said compliant member is also unstressed when said stylus projects outside the confines of said cartridge while said connector plate is held in said second angular orientation.

4,049,281

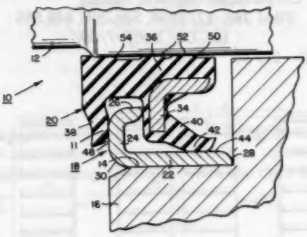
UNITIZED DUAL LIP SEAL METHOD

Dean R. Bainard, Clover, S.C., assignor to Garlock Inc., Rochester, N.Y.

Division of Ser. No. 512,205, Oct. 7, 1974, Pat. No. 3,963,248. This application Jan. 28, 1976, Ser. No. 652,901

Int. Cl.[2] F16J *15/34*

U.S. Cl. 277—1 **3 Claims**



1. A method for sealing the space between a housing bore and a shaft extending therethrough comprising positioning a wear sleeve onto one of said bore and shaft with said sleeve having a radial flange extending toward the other of said bore and shaft and having a cylindrical flange connected to the distal end of said radial flange, positioning an elastomeric member on the other of said bore and shaft, said member having an auxiliary radial portion including an auxiliary sealing lip extending radially toward the wear sleeve on one side of said flange and a main radial portion including a main sealing lip extending radially toward said wear sleeve on the other side of said flange, positioning said auxiliary sealing lip into contact with the outside radial surface of said flange, whereby a pocket for contaminate does not form and whereby water drainage is encouraged to wash sludge away from the auxiliary sealing lip, and positioning the distal end of said cylindrical flange in contact with said main radial portion when said auxiliary sealing lip is in contact with the outside radial surface of said radial flange, whereby said cylindrical flange ensures that said auxiliary sealing lip will always be in contact with said outside radial surface of said radial flange.

4,049,282

COLLET ACTUATING MECHANISMS

Norman Yearsley, Kenilworth, England, assignor to Wickman Machine Tool Sales Limited, Coventry, England

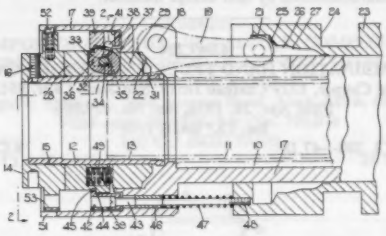
Filed June 16, 1976, Ser. No. 696,541

Claims priority, application United Kingdom, June 20, 1975, 26276/75

Int. Cl.[2] B23B *31/20, 31/10*

U.S. Cl. 279—50 **5 Claims**

1. A collet actuating mechanism comprising a hollow work spindle tube with an internal frusto conical surface at an operative end thereof, a collet tube co-axial with and slidably engaged within the work spindle tube, the collet tube having a collet threadably engaged with its end, the collet having a complimentarily frusto conical external surface engagable with the work spindle, the end of the collet being divided into a number of segments to that it can contract inwards to grip a work piece, a toggle mechanism to perform axial sliding movement between the work spindle tube and collet tube, a sleeve slidable around the work spindle tube to cause the toggles to act between the slidable tube and an assembly including springs reacting against a nut fixed relatively to the collet tube, spring means acting on one of a pair of axially relatively movable elements which, in turn, act on the toggle and on the fixed



abutment on the collet tube, respectively, and adjustable cam means also acting between said elements and arranged to alter the effective between the toggle and said abutment, the arrangement being such that the collet will grip work pieces of varying diameter with substantially the same gripping force.

4,049,283

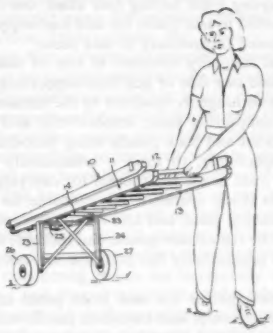
LADDER CADDY

Malcolm J. Brookes, 30 E. 68th St., New York, N.Y. 10021; James A. Sheridan, Box 295-A, Rte. 1, Englishtown, N.J. 07726, and Douglas M. Spranger, 23 Fiske Place, Brooklyn, N.Y. 11215

Division of Ser. No. 547,801, Feb. 7, 1975, Pat. No. 3,991,852. This application Apr. 29, 1976, Ser. No. 681,602

Int. Cl.[2] B62B *1/26*

U.S. Cl. 280—47.13 R **3 Claims**



1. A caddy for transporting a ladder wheel-barrow style, said ladder having rungs extending between a pair of rails, said ladder comprising:

A. a wheeled carriage having a raised bridge member which is at right angles to the direction of movement;

B. a pair of transverse pieces having a channel formation mounted at spaced positions of said bridge, said pieces having a length substantially equal to the space between said rails; and

C. a pair of clips received within the channels at opposite ends of each piece and secured thereto, said clips extending slightly beyond said ends to provide a forward set of clips and a rear set of clips, the outer faces of said clips being positioned directly adjacent said rails when said clips engage adjacent rungs of the ladder, each clip in at least one set being formed of a resilient plastic block having flat outer faces and being cut to define a pair of spring jaws which are forced apart when applied to a rung of the

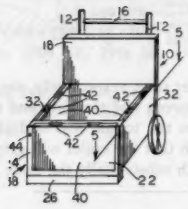
ladder, the sets being spaced apart to engage adjacent rungs on the ladder, and the distance between corresponding clips on the piece being substantially equal to the distance between the rails on the ladder whereby the outer faces of the clips are positioned directly adjacent said rails, said carriage being formed by a pair of legs whose tops are interconnected by said bridge member.

4,049,284

COMBINATION HAND TRUCK AND GARDEN CART

Ronald Capper, 1219 Chateau Drive, San Jose, Calif. 95120

Filed Apr. 26, 1976, Ser. No. 679,886
Int. Cl.[2] B62B *1/04*
U.S. Cl. 280—47.18 **9 Claims**



1. A handcart comprising:

a carrying frame including two longitudinal members having respective handles, said members being coextensively juxtaposed with one another in a longitudinal direction and at least one crossbar rigidly connecting said members;

a back panel attached to said carrying frame, said longitudinal members, said crossbar and said back panel substantially defining a plane;

at least one wheel rotatably supporting said frame;

a load-supporting plate having four sides, one of said sides being attached to said frame for said load-supporting plate to be disposed transversely to said plane;

a front panel hingedly attached to one of said four sides opposite said one side of said load-supporting plate;

two side panels hingedly attached to the remaining sides of said load-supporting plate, respectively, said side panels and said front and back panels being lockable to one another, respectively, to form a substantially box-shaped container open at the top thereof for carrying loads, said side panels being symmetrically foldable on top of said load-supporting plate, and said front panel being foldable on top of the folded side panels and lockable thereto so as to form a substantially flat platform for carrying a load; and

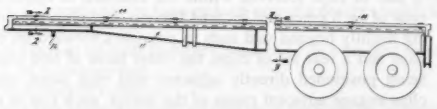
three extension panels for said front panel and said side panels, respectively, said extension panels being displaceable in an upward direction therefrom for forming an elongated box-shaped container open at the top thereof.

4,049,285

ALUMINUM PLATFORM TRAILER

George Chieger, Birmingham, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Filed Nov. 24, 1975, Ser. No. 634,356
Int. Cl.[2] B62D *21/02*
U.S. Cl. 280—106 T **8 Claims**



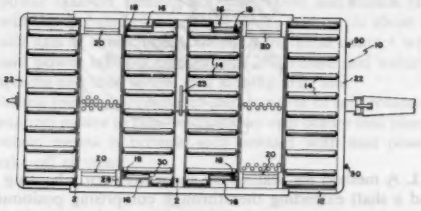
1. A platform trailer having a platform constructed from a plurality of floor boards at least two of which are of different types of extrusions joined in alternately disposed relation, the floor board of one type having spaced top and bottom panels joined by angularly disposed webs forming a triangle, the base of which forms said top panel and the apex therebelow being connected to the center of said bottom panel, the other type of floor board has top and bottom panels constructed from a central upright triangle and two inverted triangles transversely outward thereof with the side webs of said inverted triangles forming triangles with the webs of said one type of floor boards to have the top and bottom panels of the platform spaced by the angularly disposed webs when the said one and other types of floor boards are in aligned abutted, welded relation.

4,049,286

LATCH ASSEMBLY FOR CONTAINERIZED BAGGAGE TRAILER

George W. Francis, Jr., Saginaw, Mich., assignor to Saginaw Products Corporation, Saginaw, Mich.

Filed Jan. 12, 1976, Ser. No. 648,586
Int. Cl.[2] B60P *7/00*
U.S. Cl. 280—179 R **9 Claims**



9. In a containerized baggage trailer or the like having a platform adapted to support a baggage container, and latch means engageable with a baggage container on said platform for restraining said container against both lateral and vertical movement relative to said platform; the improvement comprising first and second latch members independently mounted upon said platform for movement between respective retracted positions below the surface of said platform and operative positions projecting above the surface of said platform wherein said latch members are engageable wth surfaces of a baggage container to restrain the container against lateral and vertical movement on said platform, an actuator member mounted on said platform for selectively locating said latch members in both their respective retracted and operative positions, said actuator member being movable between an actuated position wherein said actuator member retains both of said latch members in their respective operative positions, an intermediate position wherein said actuator member retains only one of said latch members in its operative position, and a release position wherein said actuator member retains neither of said latch members in their operative position.

4,049,287

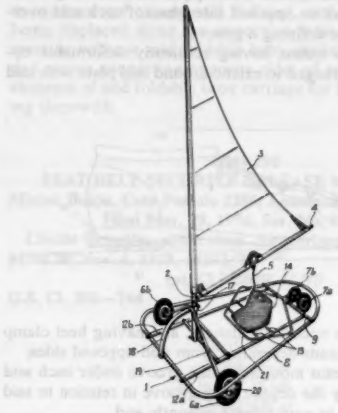
SAIL VEHICLES

Jean-Paul Dudouyt, Villa Atogebea-Avenue des Oeillets, 40150 Hossegor, France

Filed Apr. 6, 1976, Ser. No. 674,240
Claims priority, application France, Apr. 14, 1975, 75.11531
Int. Cl.[2] B62B *15/00*
U.S. Cl. 280—213 **6 Claims**

1. A wind propelled sail vehicle comprising a frame, said frame arranged to support therewithin a pair of rotatable front wheels and a pair of rotatable rear wheels arranged for steering said sailing apparatus, a triparite body having a forwardly extending portion and oppositely downwardly extending portions which are connected to the front wheels, said tripartite body further including a head which comprises a sleeve por-

tion serving to support a mast for a sail, a seat positioned rearwardly of said mast, and steering means for said rear



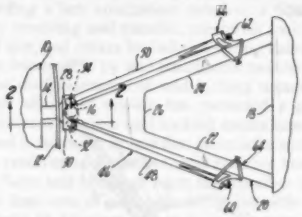
wheels arranged to be moved from an inoperative position so that a rider may enter or leave said seat to an operative position for steering said sailing apparatus when the rider is in the seat.

4,049,288

TRAILER HITCH

David A. Young, Plymouth, Mich., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed Aug. 11, 1976, Ser. No. 713,334
Int. Cl.[2] B60D *1/04*
U.S. Cl. 280—406 A **5 Claims**



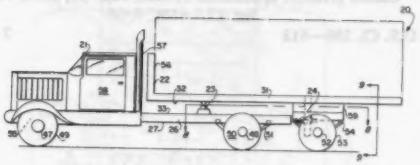
1. A trailer hitch having a ball for use with a socket of a trailer tongue to provide an articulated joint between an automobile on which the hitch is mounted and a trailer on which the trailer tongue is mounted, comprising a pair of substantially vertial-axis pivot means mounted adjacent to said ball at laterally opposite sides thereof, a pair of normally straight spring rods having angular end portions rotatably mounted in said pivot means for lateral pivotal movement of said rods, a pair of generally vertically disposed flexible suspension members having the corresponding ends thereof attached to the free ends of said rods, and means for mounting on the trailer tongue above said rods engaged by said flexible suspension members for bending said spring rods, said pivot means and said angular end portions having cooperating means preventing axial displacement of said angular end portions, the cooperating means of each pivot means and its associated angular end portion including a cicumferentially extending groove near the terminal end of said end portion, a transverse opening in the associated pivot means having an axis extending tangentially through said groove, and a removable retaining clip having a leg extending through said opening and said groove for preventing axial displacement of the angular end portion relative to its associated pivot means, each said angular end portion having a circumferentially extending groove which extends partially around its circumference sufficient to allow said lateral pivotal movement and at a location the same as that of the angular end portion of the other spring rod so that said spring rods are interchangeable.

4,049,289

COMPOSITE AUTOMOTIVE VEHICLE, COMPONENTS THEREOF, AND A METHOD OF CONSTRUCTING AND USING THE SAME

Rodger E. Deckrow, 3838 Seaman Road, Alma, Mich. 48801

Filed June 28, 1976, Ser. No. 700,076
Int. Cl.[2] B62D *53/06*
U.S. Cl. 280—423 R **29 Claims**



1. A composite automotive vehicle comprising

an automotive draft vehicle comprising a chassis, the chassis including front axle means, rear axle means, first frame means extending between the said front and rear axle means, and first suspension means carried by the said front and rear axle means for supporting the first frame means,

a load platform comprising a chassis, the chassis including tag axle means, second frame means extending from the said tag axle means to a point forward thereof, and second suspension means carried by the said tag axle means for supporting the second frame means,

primary coupler means for coupling the load platform to the automotive draft vehicle, the primary coupler means including first cooperating coupling means carried by the said first frame means between the front and rear axles and second cooperating coupling means carried by said second frame means forward of the tag axle, the said first and second coupling means cooperating to effectively couple the load platform to the draft vehicle whereby the load platform may be pulled by the draft vehicle,

the said first cooperating coupling means including a first coupler member and the said second cooperating coupling mens including a second coupler member, the said first and second coupler members including cooperating universal connecting means for universally connecting the said first and second coupler members whereby the draft vehicle and load platform at the point of coupling with the said primary coupler means are capable of dynamic relative articulated movement around the longitudinal roll and pitch axes and substantial relative lateral movement therebetween is prevented,

secondary coupler means for coupling the load platform to the automotive draft vehicle, the secondary coupler means including third cooperating coupling means carried by the said first frame means and fourth cooperating coupling means carried by the said second frame means, the third and fourth coupling means cooperating to effectively couple the load platform to te draft vehicle at a point behind the said rear axle and prevent substantial relative lateral movement therebetween,

the said primary coupler means and the said secondary coupler means being positioned substantially along the longitudinal centerlines of the load platform and draft vehicle and being effective to couple the load platform to the draft vehicle substantially along the longitudinal centerlines thereof,

the said primary coupler means and the said secondary coupler means being effective to prevent substantial lat-

eral movement between the draft vehicle and the load platform whereby the load platform may be pulled by the draft vehicle with the said tag axle tagging true behind the said rear axle, and

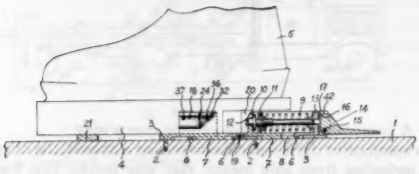
the said primary coupler means and the said secondary coupler means being effective to allow dynamic relative movement between the load platform and the draft vehicle around the longitudinal roll axis and pitch axis thereof while preventing substantial relative lateral movement therebetween.

4,049,290

SKI-BINDING

Georges Pierre Joseph Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

Filed Sept. 8, 1975, Ser. No. 611,419
Claims priority, application France, Sept. 11, 1974, 74.30734
Int. Cl.² A63C 9/08
U.S. Cl. 280—613 **7 Claims**



1. A safety binding for a ski boot comprising:

a baseplate adapted to be mounted to a ski;

a supporting element integral with said boot;

two arms pivotally mounted to said baseplate and being arranged symmetrically relative to the longitudinal axis of said ski; each arm including a retaining jaw extending over the plane of said baseplate and cooperating with a lateral edge of said supporting element;

a resilient element mounted on said baseplate;

a movement transmitting element inter-connecting said resilient element and said jaws of said arms;

said resilient element acting through said movement transmitting element to apply said jaws against said supporting element and to allow a safety release of said jaws from said supporting element in the event of an abnormally high load applied by said boot;

said arms rotating about a vertical axis and simultaneously moving longitudinally relative to said baseplate to allow clamping or release of said jaws;

said transmitting element moving longitudinally in relation to the baseplate,

each articulated arm:

rotating about a vertical axis which is fixed in relation to the transmitting element, and

pivoting slidingly about a supporting point which is fixed in relation to the baseplate and comprising a ramp upon which said supporting slides; said ramp being located between boot-retaining jaw and said vertical axis of rotation fixed in relation to the transmitting element;

said resilient element being in the form of a spring arranged along the longitudinal axis of th ski:

one end of said spring bearing against a shoulder integral with the baseplate, and

the other end of said spring bearing against a shoulder integral with said transmitting element.

4,049,291

COMBINATION REMOVABLE RELEASE SKI BINDING

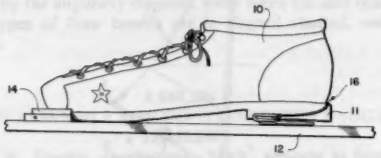
Denis M. Nunan, P.O. Box 397, Breckenridge, Colo. 80424

Filed Mar. 24, 1976, Ser. No. 669,880
Int. Cl.² A63C 9/086
U.S. Cl. 280—614 **4 Claims**

1. A ski binding conversion for mounting on cross country skis having a boot toe clamping piece for holding the toe of the boot while the heel is raised, comprising:

a. plate means for attachment to a ski positioned to permit a boot heel to rest thereon; said plate means having overhanging flanges on opposed sides thereof each said overhanging flange defining a groove;

b. spring clamp means having resiliently deformable opposed sides arranged to extend around said plate with said



opposed sides under said flanges, and having heel clamp attachment means depending from said opposed sides;

c. adjustable means mounted in the groove under each said flange to vary the depth of the groove in relation to said spring means to vary release strength; and

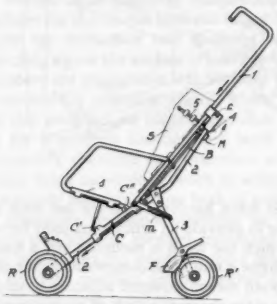
d. removable boot heel clamp means arranged to be removably secured to said heel clamp attachment means for securing a boot heel to said spring clamp means.

4,049,292

BABY CARRIAGE FOLDABLE IN WIDTH AND SHORTENABLE IN HEIGHT SO AS TO BE EASILY CARRIED ON A PERSON'S ARM LIKE AN UMBRELLA

Giuseppe Perego, Arcore (Milan), Italy, assignor to Perego-Pines S.p.A., Italy

Filed Jan. 9, 1976, Ser. No. 647,876
Claims priority, application Italy, July 25, 1975, 25753/75
Int. Cl.² B62B 7/08
U.S. Cl. 280—642 **7 Claims**



1. A foldable baby carriage comprising, in combination, a pair of laterally spaced elongated handles; respective upper sleeves slidable on said handles; a pair of elongated front legs having their upper ends secured to said respective upper sleeves; a pair of elongated rear legs each pivotally connected to an intermediate portion of a respective front leg; respective wheels on the lower ends of said front and rear legs; respective means interconnecting each rear leg to the lower end of the adjacent handle to move the rear legs toward the front legs when the carriage is folded and to maintain the rear legs extended when the carriage is erected; respective lower sleeves slidable on the lower portions of said front legs; an X-frame, formed by a pair of elongated arms pivotally interconnected intermediate their ends, each arm having its upper end pivotally connected to the upper sleeve slidable on one handle and

its lower end pivotally connected to the lower sleeve slidable on that front leg connected to the upper sleeve slidable on the other handle; operating means interconnecting said upper sleeves for conjoint displacement along the respective handles to contract and expand said X-frame, with said lower sleeves being displaced along the respective front legs, to selectively erect or collapse said foldable baby carriage; a foldable seat; and means connecting opposite sides of said foldable seat to elements of said foldable baby carriage for folding and unfolding therewith.

4,049,293

SEAT BELT SECURITY RELEASE MECHANISM

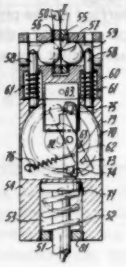
Michel Bouju, Case Postale 2286, Lausanne, Switzerland

Filed Mar. 29, 1976, Ser. No. 671,039

Claims priority, application Switzerland, July 17, 1975, 9478/75; Nov. 4, 1975, 14233/75

Int. Cl.² B60R *21/10*

U.S. Cl. 280—744 **6 Claims**



1. In a security release mechanism for connection between a safety seat belt and an anchoring means to produce automatic opening of the belt after a given time following an impact, comprising a belt attachment member, a first piece having a slot for receiving said member, means for locking said member in said slot, and means including a spring submitted to the belt tension transmitted by said attachment member for controlling delayed disengagement of said locking means to release said member after said tension has exceeded a given value, the improvement wherein said locking means comprises two balls disposed in housings in said first piece adjacent part of said slot which receives said member, said member having an opening which faces said housings when said member is located in said slot, at least one of said balls being movable away from the other into its housing, and at least one retractable abutment normally holding said movable ball against the other ball in said opening of said member to lock said member in said slot, said delayed-disengagement control means comprising means for retracting said abutment to allow said movable ball to move away from the other to free said belt attachment member.

4,049,294

NARROW BASE PROTECTIVE FRAME

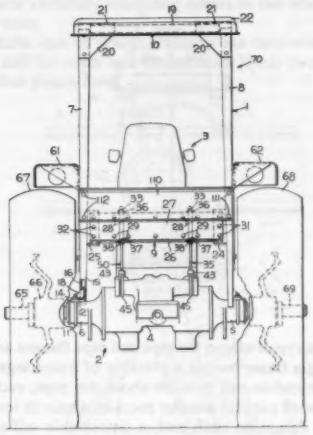
Ralph R. Atherton, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 22, 1975, Ser. No. 643,318

Int. Cl.² B62D *25/06*

U.S. Cl. 280—756 **10 Claims**

1. A tractor having a narrow base protective frame comprising, a tractor including a rear drive assembly housing and a rear axle housing extending to each side of said rear drive assembly housing, a rear drive axle extending from each rear axle housing, a rear drive wheel mounted on each drive axle for adjustably moving axially to vary the tread widths of said drive wheels, means defining a tapered structure from the top to the bottom in a transverse direction for protecting an occupant, said means including a tapered upright column mounted on each of said rear axle housings, each of said upright columns being tapered with a narrower bottom than top as viewed in transverse cross-section, a base integral with said tapered upright column defining a width no wider than to accommodate bolting of the column and base to the rear axle housing, a crossbeam and reinforcing means connected between the upper ends of said tapered upright columns, a cross-member



connecting the lower portion of said columns forming an integral structure with said columns, means integrally fastening said cross-member to each of said tapered columns and reinforcing said tapered upright columns across their width fore and aft and a portion of their length, with reinforcement of the protective frame around the operator station of the tractor for operator safety in the event of rollover of the tractor.

4,049,295

COUPLINGS FOR METAL TUBES

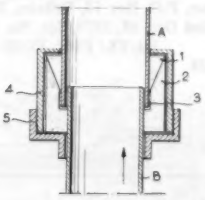
Eugéne Piers, 168 Blvd. Magenta, 75010 Paris, France

Filed Apr. 13, 1976, Ser. No. 676,379

Claims priority, application France, June 27, 1975, 75.20236

Int. Cl.² F16L *55/00*

U.S. Cl. 285—9 M **1 Claim**



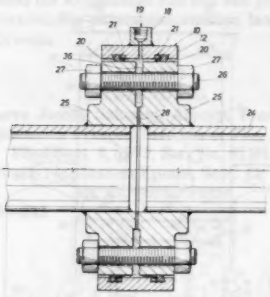
1. A fluid-tight saftey coupling for metal tubes comprising a male conical metal element fixed to a first tube and a female conical metal element fixed to a second tube, said male and female metal elements having surfaces constituting cones of identical pitch, both of said elements being permanent magnets, the female element being formed with a cylindrical recess coaxial with the said female element and located at the narrow end of said female element to receive the end of said first tube therein, in overlapping relation to the end of said second tube.

4,049,296

LEAK REPAIR CLAMP

George W. Harrison, Alvin, Tex., assignor to Team, Inc., Alvin, Tex.

Filed May 3, 1976, Ser. No. 682,485
Int. Cl.[2] F16L *55/16*
U.S. Cl. 285—15 1 Claim



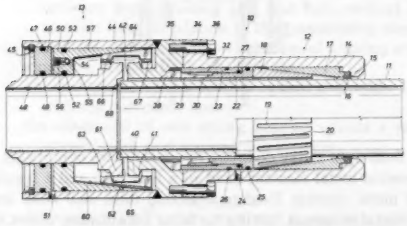
1. A leak repair clamp for pipe and pipe flanges and the like, comprising a frame having a plurality of frame segments positionable in end-to-end relation about the pipe, each segment having spaced parallel annular recesses about its inner periphery and a flange on each end, a deformable self-sealing seal member having a base portion which is dove-tailed shape and a flexible sealing tip portion for bending over in order to extend toward the other sealing tip portion when sealed about the pipe extending inwardly from said base portion, retaining means connected to each segment for retaining the base portion of a seal member within each recess by a fastener which is threadably connected to the recess on the inner side of the base portion so as to underlie at least a portion of the bent-over sealing tip portion, the recess and retaining means having tapered end walls which form a dove-tailed channel with the bottom wall of the recess to fit tightly against the end and bottom walls of the base portion of the seal member, and means for connecting the frame segments to one another with the end faces of said flanges being brought into metal-to-metal sealing engagement when positioned in end-to-end relation about the pipe, so as to clamp the frame about the pipe and thereby cause the sealing tip portions of the seal members to be deformed into sealing engagement about the pipe on opposite sides of the leak as the frame is so clamped.

4,049,297

PIPE COUPLING APPARATUS

Bobby J. Reneau, P.O. Box 14, Bellaire, Tex. 77401

Filed Dec. 15, 1975, Ser. No. 640,576
Int. Cl.[2] F16L *35/00*
U.S. Cl. 285—24 9 Claims



1. For use in connecting a first pipe to a second pipe, a coupling apparatus which comprises:

an elongated cylindrical housing adapted to telescope over the end of a first pipe;

pipe clamping means carried in said housing for clamping and holding the end of the first pipe;

a second housing enclosing a pipe segment adapted to be joined to a second pipe which is to be connected to the first pipe;

means for axially aligning said first and second housings with one another;

an encircling shoulder fixedly connected to said first housing;

a parallel encircling shoulder fixedly attached to said second housing;

lock means for grasping said shoulders and pulling said shoulders toward one another, said lock means drawing the end of the first pipe against the pipe segment to axially communicate them;

said lock means including;

a collet means for clamping the pipe, said collet means centering the pipe at a specified location;

a seal means around the pipe sealing the pipe against leakage along said first housing;

a facing and mating surface on the pipe segment for abutting and joining the pipe segment to the first pipe; and

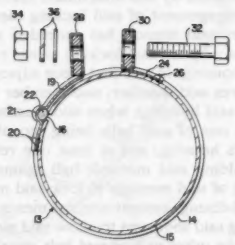
means for actuating said collet means.

4,049,298

COMPRESSION COUPLING

Sam J. Foti, Lyndhurst, Ohio, assignor to The Federal Metal Hose Corporation, Painesville, Ohio

Filed Oct. 16, 1975, Ser. No. 623,058
Int. Cl.[2] F16L *25/00*
U.S. Cl. 285—177 9 Claims



1. A compression coupling for fitting around cylindrical objects, which comprises:

a circumferentially extensible, annular sleeve for extending around the cylindrical objects and having a gap therein extending parallel to the longitudinal axis;

a relatively thin jacket member attached at one end to the sleeve, the jacket member extending over the gap and having an axially extending conformable wrinkle formed therein over the gap, said wrinkle being adapted to receive a sealant radially outside the sleeve; and

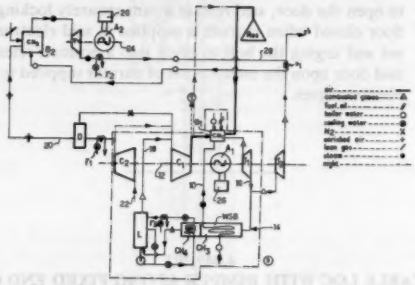
means for clamping the other end of the jacket member to the sleeve on the opposite side of the gap from which the jacket member is attached to the sleeve, whereby when clamped the wrinkle is substantially conformed to the circumference of the annular sleeve and the sealant is forced radially inwardly and pressed into the gap.

4,049,299

ANTI-POLLUTING POWER PLANT USING COMPRESSORS AND GAS TURBINES

Georges Alfred Rigollot, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Continuation-in-part of Ser. No. 450,067, March 11, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,814
Claims priority, application France, Mar. 12, 1973, 73.08724
Int. Cl.² F01D *15/10*
U.S. Cl. 290—52 **13 Claims**



1. A versatile electric power generating plant operative during normal and peak power demand periods and also during no power demand periods comprising in combination: first and second continuously operating compressors having matched operating characteristics; supply means for selectively supplying said first compressor during normal and peak power demand periods with recycled combusted gases for pressurizing same; means for selectively supplying said second compressor also during normal and peak power demand periods with air for pressurizing same; first and second boilers having first and second combustion chambers, respectively, supplied with pressurized recycle combusted gases and air from said first and second compressors, respectively, during normal and peak power demand periods; an air storage tank supplied with pressurized air to store the same, means for connecting said second compressor in series with said first compressor and said first compressor with said air storage tank for pressurizing said tank with air during no power demand periods; means for supplying pressurized air from said air storage tank to said first combustion chamber during normal and peak power demand periods; first and second turbines respectively connected to the outputs from said first and second combustion chambers; first and second alternators respectively connected to said first and second turbines for drive thereby during normal and peak power demand periods, at least said first compressor, turbine and alternator being coupled to a common shaft for drive of said first compressor by said first alternator during no power demand periods and for drive of said first compressor and said first alternator by said first turbine during normal and peak power demand periods; and recycle means for receiving at least a portion of the output of said first turbine for supply of a part of said recycled gas by said supply means to said first compressor.

4,049,300

FLUID DRIVEN POWER PRODUCING APPARATUS

Daniel J. Schneider, 608 Durango Circle South, Irving, Tex. 75062

Continuation in part of Ser. No. 483,092, June 24, 1974, abandoned. This application Mar. 31, 1976, Ser. No. 672,246
Int. Cl.² F03D *5/02*
U.S. Cl. 290—54 **37 Claims**

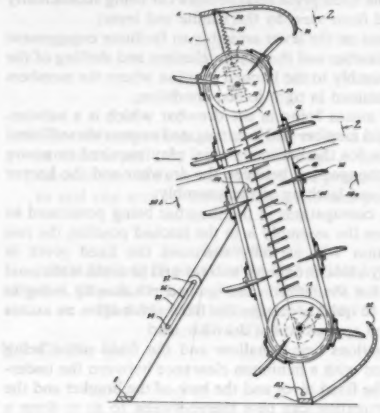
1. An apparatus for use in converting the kinetic energy of an accelerated fluid into mechanical or electrical energy and which comprises:

a. a housing;

b. two substantially parallel axles detachably supported by said housing and capable of rotation within the housing;

c. two substantially parallel wheels positioned on each of said axles and the wheels on one axle being in substantially the same vertically extending planes as the wheels on the other axle;

d. two belts, one of which connects the two wheels in one plane and the other belt connects the other two wheels in the other plane; and



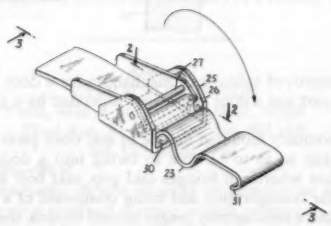
e. a series of foils fluid dynamically designed to have a high lift configuration, each one of which is detachably connected at the opposite ends thereof respectively to the two belts, wherein (d) and (e) taken together form two stages, a first drive stage and a second return stage of said apparatus, further wherein the foils are fluid dynamically designed, spaced and oriented within the apparatus such that all of the flow of fluid entering the second stage on operation of the apparatus is made up of fluid which has interacted dynamically with the foils of the first stage.

4,049,301

TOGGLE LATCH

Peter Schenk, West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Continuation of Ser. No. 480,391, June 18, 1974, abandoned. This application Dec. 10, 1975, Ser. No. 639,422
Int. Cl.² E05C *19/14*
U.S. Cl. 292—113 **5 Claims**



1. A toggle latch for joining together two members comprising:

a fixed engageable keeper element adapted to be secured to one of the members;

a lever assembly adapted to be secured to the other member; said lever assembly including a bracket, an operating lever

secured to the bracket by a fixed pivot at an intermediate portion of the lever and a drawbar secured to one end of the lever beyond the fixed pivot by means of a movable pivot;

the opposite end of the lever forming a handle;

the movable pivot being positioned relative to the fixed pivot so that when the drawbar is engaged with the keeper and the handle is shifted to the latched position the movable pivot and portion of the drawbar connected and adjacent thereto will be shifted around and into a latched position behind and above the fixed pivot with the remainder of the drawbar extending outwardly from the underside of the fixed pivot and the drawbar being substantially obscured from view by the handle and lever;

spring means on the lever assembly to facilitate engagement of the drawbar and the keeper element and shifting of the lever assembly to the latched position where the members are maintained in tight joined condition;

the spring means being in the drawbar which is a substantially rigid member and is corrugated to provide sufficient resilience for the necessary axial play required to assure proper engagement between the drawbar and the keeper element and latching of the assembly;

one of the corrugations in the drawbar being positioned so that when the assembly is in the latched position the one corrugation will partially surround the fixed pivot in relatively close proximity thereto and provide additional support for the latch in the latched position by being in position to quickly engage the fixed pivot upon an excess of tension applied to the drawbar; and

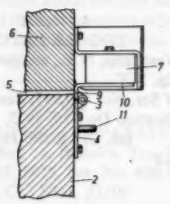
the corrugations being shallow and the fixed pivot being positioned with a minimum clearance between the underside of the fixed pivot and the base of the bracket and the one corrugation can pass therebetween so as to form a compact toggle latch with a pleasing visual appearance.

4,049,302

SAFETY LOCK MECHANISM

Henry Veine Andersson, and Sven Vilhelm Eriksson, both of Goteborg, Sweden, assignors to AB Telekontroll, Goteborg, Sweden

Filed Dec. 9, 1975, Ser. No. 639,161
Claims priority, application Sweden, Dec. 12, 1974, 7415589
Int. Cl.[2] E05C *19/16*
U.S. Cl. 292—201 **4 Claims**



1. An improved safety lock mechanism for a door having a door leaf part and a door frame part separated by a gap, comprising:

a bolt pivotally mounted on one of said door parts adjacent said gap so as to be able to swing into a door-locking position wherein it bridges said gap, said bolt having an angular configuration and being comprised of a first section and a substantially longer second section, the first and second sections being rigidly connected together essentially at right angles, when in the door-locking position the first section being essentially parallel to the surface of the one door part and located closer to the surface of the one door part than is the second section, the first section extending across the gap toward said other door part;

an electromagnet provided with an interruptable supply of current and being mounted on the other of said door parts so as to be able to retain said bolt in the door-locking position, the surface of attraction of said electromagnet being directed toward said one door part and being positioned so as to extend outwardly away from the other door part essentially at right angles to said other door part, the second section of the bolt extends essentially at right angles outwardly away from the other door part along the surface of attraction of said electromagnet when the bolt is in the door-locking position; and

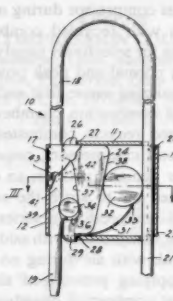
release means, connected to the other of said door parts and intercepting the first section of said bolt when in its door-locking position, for pressing against the first section of said bolt upon the application of a force on the door leaf to open the door, said release means securely locking the door closed when current is supplied to said electromagnet and urging the bolt to pivot into a position releasing said door upon the interruption of current supplied to said electromagnet.

4,049,303

CABLE LOC WITH DIMPLE ALONG FIXED END OF CABLE TO ASSURE INTEGRITY OF SEAL

George Irwin, Fremont, and Gary Butler, LaGrange, both of Ind., assignors to Brammall, Inc., Angola, Ind.

Filed Mar. 3, 1976, Ser. No. 663,355
Int. Cl.[2] G09F *3/00*
U.S. Cl. 292—307 R **3 Claims**



1. A cable lock and seal device comprising,

a body member with a pair of parallel orifices on opposite sides thereof,

a cam member in said body member and formed with first and second inclined surfaces on opposite sides thereof,

a spring means in said body member,

a first disc mounted in said body member on one side and engageable with said spring member and said first inclined surface,

a second disc mounted in said body member on the opposite side and engageable with said second inclined surface,

a cable with a first end extending into one of said pair of orifices and held in said body member between said second disc and said body member,

an indentation formed in said body member to lock said first end of said cable to said body member,

the second end of said cable receivable into the other of said pair of orifices and locked against one direction motion between said first disc and said body member, and

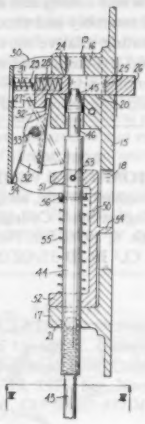
wherein said second disc and said indentation lock said one end of said cable to the body member to prevent it from moving in either direction relative to said body member.

4,049,304

SELF-LATCHING FLUSH BOLT

William B. Imboff, Springdale, Conn., assignor to Leigh Products, Inc., Coopersville, Mich.

Filed Dec. 13, 1976, Ser. No. 749,703
Int. Cl.[2] E05C 1/12
U.S. Cl. 292—333 7 Claims



1. A self-latching flush bolt for use in the inactive door of a pair of swinging doors comprising, a bolt mechanism frame adapted for mounting in the edge of a door and including a flat plate and upper and lower bearing blocks extending inward from said plate, the plate being traversed by a vertically elongated slot, the upper block being traversed by intersecting vertical and horizontal bores and the lower block being traversed by a vertical bore aligned with the vertical bore in the upper block, a trigger slidably mounted in said horizontal bore, the trigger having a slot adapted to be moved into and out of register with the vertical bore in the upper block, and a bolt assembly having a bolt at one end adapted for installation adjacent a top or bottom edge of the door, a head at the other end and a rod-like element connecting the bolt to the head, means retaining the head within said last named vertical bore for vertical reciprocation therein between positions corresponding to engaged and disengaged positions of the bolt, and the head being engageable with an edge of said trigger slot to retain the bolt in disengaged position.

4,049,305

CAB DOOR LATCH MECHANISM

Ture R. Zetterlund, Naperville, and Arthur A. Amberg, Plainfield, both of Ill., assignors to International Harvester Company, Chicago, Ill.

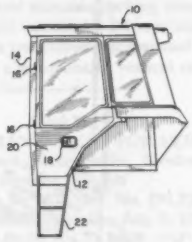
Filed Aug. 20, 1976, Ser. No. 716,482
Int. Cl.[2] E05C 3/26
U.S. Cl. 292—336.3 2 Claims

1. A door latch mechanism for a tractor cab with a door having inside and outside walls and having one end pivotally attached to said cab, said mechanism including, in combination:

an engagement catch mounted on said door opposite said pivotal door attachment, said catch including; a pivotally mounted disengagement arm located between said inside and outside walls;

an external handle mounted on said outside wall between said latch and said pivotal door attachment, said external handle including; pivotal activator means for disengaging said catch and pivoting said door, and a pivotally mounted push lever operably connected to said activator means and said catch;

an internal handle mounted on said inside wall between said external handle and said catch, said internal handle including; a pivotal paddle handle, and a pivotally mounted extension operably connected to said paddle handle and said catch;



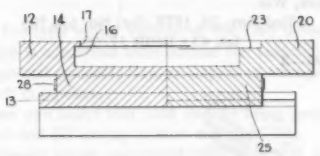
rod means connecting said push lever, said catch and said extension, said rod means including; a one way lever mounted on said extension, and a rod pivotally connected to said one way lever, said catch and said push lever.

4,049,306

HOLDER FOR SHOE POLISH CONTAINERS

Alfred A. Caputi, 61 Sterling Ave., Buffalo, N.Y. 14206

Filed May 10, 1976, Ser. No. 684,764
Int. Cl.[2] A47L 23/28
U.S. Cl. 294—34 2 Claims



1. In a holder for a circular container for shoe polish or the like having an annular flange thereabout and a circular cover, a body member and a clamp member, said members having co-planar upper surface portions, said clamp member and said body member having cooperating guide formations for movement of said clamp member upper surface portion toward and away from abutment with said body member upper surface portion, said body member having a handle formation at its under side, and resilient means urging said clamp member upper surface portion toward said body member upper surface portion, said upper surface portions having complementary generally semi-circular recesses for jointly receiving and clamping opposite sides of the periphery of a circular container therein.

4,049,307

EXTRACTOR DEVICE

Walter C. Potts, 4525 A St., Lincoln, Nebr. 68510

Filed Apr. 30, 1976, Ser. No. 682,115
Int. Cl.[2] B66C 1/44
U.S. Cl. 294—99 R 9 Claims

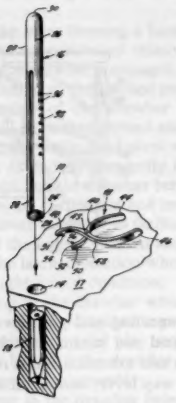
1. An extractor device adapted to remove an elongated element from a confined opening, which comprises:

a. an elongated housing having first and second ends, a wall, and a longitudinally placed bore therethrough, said well of said housing having a pair of longitudinally aligned rows of apertures therein, said elongated element adapted to be received into said bore of said housing;

b. a plier-like member including a pair of arms pivotally joined together at their centers, each said arm having a jaw and a handle end; and

c. a pin member included on an inner face of each said jaw

end, an aperture of one of said rows for receiving one of said pin members, a corresponding aligned aperture of the



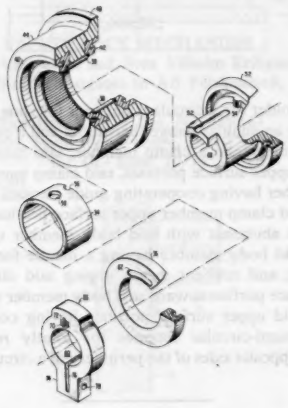
other of said rows for receiving the other of said pin members.

4,049,308

SYNTHETIC FLANGED CARRIER ROLLER

Donald E. Martin, Waukesha, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Nov. 24, 1975, Ser. No. 634,705
Int. Cl.[2] B60B *17/00*
U.S. Cl. 295—8 **19 Claims**



1. A carrier roller comprising an integral roller tire subassembly, said integral roller tire subassembly comprising:

a. a bearing;

b. a left-hand axial insert abutting a portion of the left-hand axial face and the outer radial (circumferential) face of said bearing, having an axial opening therein, and made from a synthetic material which is resilient relative to said bearing;

c. a right-hand axial insert abutting a portion of the right-hand axial face and the outer radial (circumferential) face of said bearing, having an axial opening therein, and made from a synthetic material which is resilient relative to said bearing;

d. a roller tire made from a moldable material which is resilient relative to said bearing and said inserts, said roller tire abutting the remainder of the outer radial (circumferential) face of said bearing, the remainder of the right-hand axial face and the radially outer (circumferential) face of said left-hand axial insert, and the remainder of the left-hand axial face and the radially outer (circumferential) face of said right-hand axial insert, whereby said roller tire is molded around said inserts and said bearing, said inserts hold said bearing in position in the assembled carrier roller, and the relative resiliency of said roller tire prevents overload on and consequent damage to said bearing both from initial assembly and shock loads during use;

e. means for preventing relative movement of said molded roller tire and said left-hand axial insert; and

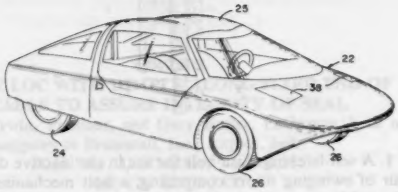
f. means for preventing relative movement of said molded roller tire and said right-hand axial insert.

4,049,309

AUTOMOTIVE VEHICLE

Michael R. Seal, Bellingham, Wash., assignor to Board of Trustees Western Washington State College, Bellingham, Wash.

Filed Feb. 6, 1976, Ser. No. 655,865
Int. Cl.[2] B62D *35/02, 37/02*
U.S. Cl. 296—1 S **8 Claims**



1. An aerodynamically efficient structure for an automobile vehicle comprising:

a chassis,

forward and rearward wheels supporting the chassis, a body enclosure carried on said chassis, said body enclosure having an underside, and a downwardly and forwardly inclined, uninterrupted smooth top surface including a front closue, windshield and passenger compartment, and a rearwardly and downwardly inclined rear closure.

said rearward wheels each having a diameter greater than the forward wheel and connected to said chassis so as to provide a forwardly and downwardly inclined slope to the chassis and underside of the body enclosure whereby the entire chassis and body enclosure has an inclination to increase downward pressure on the vehicle forward end and reduce aerodynamic drag,

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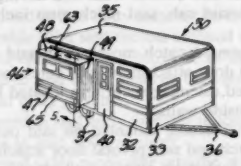
4,049,310

RECREATIONAL VEHICLE WITH EXPANSIBLE SECTION

Perry E. Yoder, 602 Middlebury St., Goshen, Ind. 46526

Filed Dec. 22, 1975, Ser. No. 642,681
Int. Cl.[2] B62D *33/08*
U.S. Cl. 296—26 **6 Claims**



1. A recreational vehicle having a body including a floor and a side wall having an opening, an extension unit having an outer wall, a top wall, a floor and opposite end walls and

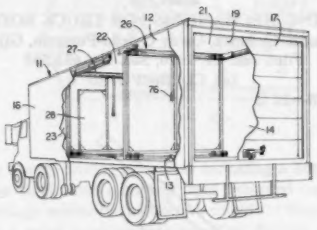
shiftable in said body opening between a retracted position with its outer wall substantially flush with said vehicle side wall and an extended position projecting outwardly from said vehicle side wall, means for limiting outward movement of said extension unit, means for sealing said vehicle at said opening in the extended and retracted positions of said extension unit, a plurality of rollers supporting the floor of said extension unit at a plurality of points spaced laterally and longitudinally of the vehicle to accommodate movement between cantilevered extended position and retracted position, and means for guiding movement of said extension unit and preventing downward tilting of the outer part of said unit when in cantilevered extended position, some of said rollers being located adjacent the vehicle side wall to support a central portion of the floor of the extension unit, struts secured to and extending below inner corners of the floor of the extension unit toward said vehicle floor and each journaling a roller, said guide means including tracks carried by the floor of said extension unit engaging the rollers located adjacent to the vehicle side wall and having configurations complementary to the configurations of the rollers engaged thereby.

4,049,311

BULKHEAD DOOR

Alfred T. Dietrich, and Gerald W. Galbreath, both of Marion, Ohio, assignors to Overhead Door Corporation, Dallas, Tex.

Filed Jan. 19, 1976, Ser. No. 650,464
Int. Cl.[2] B62D *33/04*
U.S. Cl. 296—24 R **22 Claims**



1. In a storage structure having wall means defining a storage compartment therein, said wall means including opposed top and bottom walls and a pair of opposed side walls, and a bulkhead door assembly for dividing said compartment into subcompartments, said bulkhead door assembly including panel means extending transversely across said compartment, the improvement wherein said bulkhead door assembly comprises:

a pair of track means fixedly mounted on said wall means in spaced and substantially parallel relationship;

a pair of support mechanisms mounted on said panel means adjacent one edge thereof for supporting said panel means on said track means, each said support mechanism including

a. roller carriage means disposed in rolling engagement with said track means,

b. hinge means pivotally connecting said panel means to said carriage means for permitting pivotal movement of said panel means about an axis which is disposed closely adjacent and extends substantially parallel to said one edge, and

c. releasable latch means coacting between said panel means and said track means for fixedly locking said one edge of said panel means relative to said track means to prevent displacement of said carriage means along said track means;

a pair of releasable locking mechanisms mounted on said panel means adjacent a further edge thereof which is disposed opposite and substantially parallel to said one edge, said locking mechanisms including locking means movable supported on said panel means and engageable with said track means when said panel means is in a stored position wherein it is disposed closely adjacent and substantially parallel to one of said walls; and

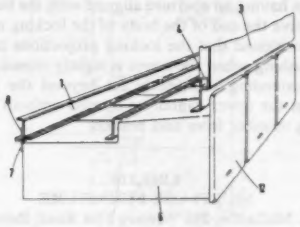
lock means fixedly associated with said wall means and engageable with said movable locking means for fixedly holding said panel means in an operational position wherein it extends transversely across said compartment and is disposed in a substantially vertical orientation.

4,049,312

STORAGE ARRANGEMENT FOR VEHICLES

Per-Olof Bertil Rudbeck, Katrineholm, Sweden, assignor to Saab-Scania, Scania Division, Sweden

Filed June 30, 1975, Ser. No. 591,529
Claims priority, application Sweden, July 8, 1974, 74089343
Int. Cl.[2] B62D *25/20*; B60R *9/00*
U.S. Cl. 296—28 A **6 Claims**



1. In a bus-type motor vehicle of the kind having storage space which is accessible from outside the vehicle through at least one pivotal openable flap, an improved storage compartment which comprises:

a. at least one insert unit, said unit (i) being generally box shaped and (ii) having at least one open side,

b. attachment means associated with each said unit for removably supporting each unit in said storage space, said attachment means (i) being detachable, from said vehicle, and (ii) being arranged so as to locate and readily removably support each unit beneath the floor of said vehicle with said open side thereof lying in a place coinciding with one of the side walls of the vehicle body so that its open side will be closed by a pivotal openable flap, when the latter is in a closed position,

c. the number of insert units provided determining the usable storage space of the compartment and having dimensions chosen to conform to a modular system,

d. said at least one openable flap being arranged so as to conform to the external shape of said vehicle body when said flap is in its closed position,

e. said openable flap being arranged in said modular system,

f. any portion of said space designated for said insert units but not occupied by said units being covered by at least one cover plate which is (i) fixedly located and (ii) covering said portion, said cover plate being arranged in said modular system so as to conform to the external shape of said vehicle body.

4,049,313

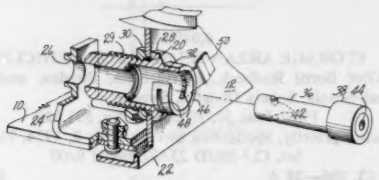
LOCKING RECEPTACLE FOR ELECTRIC METER BOX OR THE LIKE

George A. Lundberg, Pompton Lakes, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Jan. 12, 1976, Ser. No. 648,193
Int. Cl.[2] E05C *19/18*; B65D *33/34*
U.S. Cl. 292—307 R **4 Claims**

1. In an electric meter box having an open side and a cover for said open side hinged to the box at one edge, an assembly for receiving a locking member of the type having an enlarged

head at one end and an elongated body with expansible locking projections near the other end, said assembly comprising a bushing mounted (for mounting) in said cover near the edge opposite said hinged edge, said bushing having an aperture with an outer portion sized to receive the enlarged head of the locking member and an inner portion sized to receive the body of the locking member and a bracket mounted in the housing,



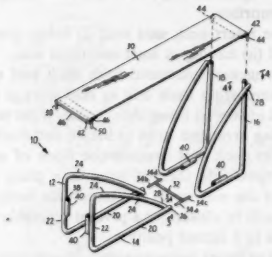
said bracket having an aperture aligned with the bushing aperture to receive the end of the body of the locking member and being so positioned that the locking projections can lock behind the bushing when the cover is tightly closed, the end of the body extending sufficiently far beyond the rear of the bracket that the cover cannot be opened without removal of the locking member from said bracket.

4,049,314

MULTI-USE FURNITURE

Andrew W. McGaffin, 282 Western Hut Road, Belmont, Lower Hut, Wellington, New Zealand

Filed Mar. 24, 1976, Ser. No. 669,851
Int. Cl.[2] A47C *13/00*
U.S. Cl. 297—130 **11 Claims**



1. A convertible piece of furniture including four separate and independent frame elements each of which comprises a generally right triangularly shaped frame member having a long base, a short leg and a hypotenuse leg; means for releasably and selectively securing said frame members together in generally aligned pairs with the pairs located in spaced parallel relation to each other; a flexible sling and means secured to said sling for securing the sling to said spaced parallel pairs of frame elements; said means for releasably and selectively securing said frame members together comprising means for (i) securing the long bases of said frame elements together adjacent their apices with said hypotenuse leg; and (ii) securing the hypotenuse legs together adjacent their apices with said long base.

4,049,315

CHAIR HAVING INDEPENDENT SEAT AND BACK

John D. Jacobson, 411 Temple St., New Haven, Conn. 06511

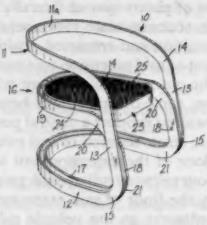
Filed Dec. 13, 1976, Ser. No. 750,114
Int. Cl.[2] A47C *1/12*
U.S. Cl. 297—447 **8 Claims**

1. A chair comprising:

seat support means having a lower portion adapted to contact a floor and an elevated portion supported in cantilevered fashion;

seat means having a periphery adapted to be supported by said seat support means;

spacer means adapted to be connected to said elevated portion and said periphery at preselected discrete points thereof to support said means at a preselected height above the floor;



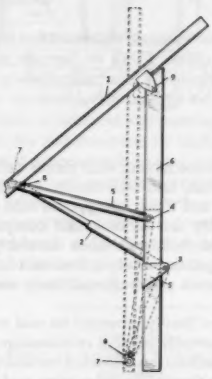
back means comprising back support means adapted to contact a floor and an elevated back portion supported in cantilevered fashion above said seat means by said back support means; and further spacer means adapted to be connected to said back support means and said lower portion of said seat support means at preselected points thereof.

4,049,316

LIFTING MECHANISMS FOR TRUCK BODIES

Marino Paneda Ordonez, Ca de Oviedo-Pumarin, Gijon, Spain

Filed Jan. 29, 1976, Ser. No. 653,583
Int. Cl.[2] B60P *1/16*
U.S. Cl. 298—22 B **5 Claims**



1. A lifting mechanism for truck bodies and the like in combination with a pair of laterally spaced longitudinal stationary frame members, a dump frame including a pair of laterally spaced longitudinal track members pivotally connected to said stationary frame members adjacent one end thereof, said longitudinal track members disposed in a plane immediately above and parallel to the plane of said longitudinal stationary frame members, a rectangular frame stabilizer assembly positioned between and spanning substantially the entire lateral distance between said stationary frame members, an X-brace on said rectangular frame stabilizer assembly and extending the length thereof, a pair of pivot connections connecting the opposite sides of the inner end of said rectangular frame stabilizer assembly to a medial portion of said pair of laterally spaced stationary frame members, a pair of connectors on the opposite sides of the outer end of said rectangular frame stabilizer assembly engaged for sliding movement in said pair of laterally spaced longitudinal track members, the said opposite end of the

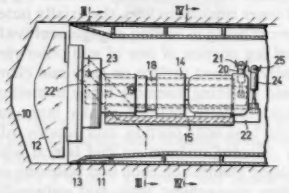
rectangular frame stabilizer assembly spanning substantially the entire lateral distance between said longitudinal track members, at least one extensible lift cylinder pivotally connected at one end between and in the plane of said stationary frame members and pivotally connected at the opposite end to the outer end of said rectangular frame stabilizer assembly in the plane of the longitudinal track members in the lowered position, said lift cylinder positioned beneath said X-brace of said rectangular frame in the lowered position, whereby upon extension of said extensible lift cylinder said dump frame is moved about its pivot connection with said stationary frame members from a horizontal position to a raised dump position.

4,049,317

TUNNEL DRIVING APPARATUS

Hans Gunter Follert, Dortmund, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Westphalia, Germany

Filed Jan. 22, 1976, Ser. No. 651,613
Claims priority, application Germany, Feb. 3, 1975, 2504370
Int. Cl.² E01G *3/04*
U.S. Cl. 299—33 **11 Claims**



1. In a tunnel driving apparatus including a hollow tubular protective shield and a cutting head mounted on a movable undercarriage within the protective shield for detaching material from a mine working face to effect driving of a tunnel, improved means for supporting and for selectively positioning the undercarriage, said improved means comprising:

a. rocker arm means extending longitudinally within the hollow protective shield, said rocker arm means being pivotally attached near its front end to the protective shield by a transversely extending first pivot means;

b. first ram means pivotally attached at one of its end to the protective shield and pivotally attached at the other of its ends near the rear end of said rocker arm means, said first ram means being selectively actuated to pivot said rocker arm means about the transversely extending first pivot means;

c. longitudinal support means for mouting the undercarriage for slidable movement thereon, said longitudinal support means extending longitudinally within the hollow protective shield and being pivotally attached near its front end to said rocker arm means by a transversely extending second pivot means.

d. second ram means pivotally attached at one of its ends to the protective shield and pivotally attached at the other ot its ends near the rear end of said longitudinal support means, said second ram means being selectively actuated to pivot said longitudinal support means about the transversely extending second pivot means;

e. said first ram means actuation raising and lowering the transversely extending axis of the second pivot means relative to the longitudinal axis of the protective shield; and

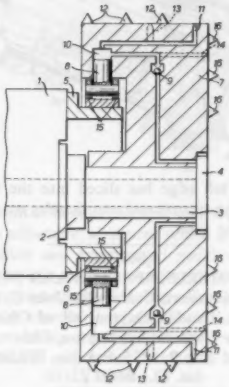
f. said second ram means actuation angularly altering the angle of the longitudinal axis of the cutting head relative to the longitudinal axis of the protective shield.

4,049,318

MINING MACHINE WITH CAM-OPERATED WATER JET PUMP

Harry James Fruin, Staincross, England, assignor to Dresser Europe S.A., Brussels, Belgium

Filed Oct. 28, 1975, Ser. No. 626,544
Claims priority, application United Kingdom, Nov. 1, 1974, 47442/74
Int. Cl.² E21C *25/60*
U.S. Cl. 299—81 **22 Claims**



1. A mining machine adapted to work a mine face comprising: a non-rotational stationary portion, a rotary part rotatably mounted on the said stationary portion for rotation relative thereto, said rotary part including a liquid outlet orifice constructed such that liquid passes therethrough as a jet, passage means for providing a passage for a liquid through the rotary part to the orifice, said orifice being constructed to provide a jet of liquid, a pump means operatively connected to the rotary part for rotation therewith, a cam bearing fixedly mounted on the said stationary portion and positioned to act directly upon the pump means such that the pump means is operated directly in response to rotation of the rotary part, relative to the stationary part, for supplying the liquid in said passage means to the orifice with a pressure which varies continuously to reach a maximum value periodically, whereby the jet is directed at the material being mined at least some of the times the jet is at or near its maximum pressure.

4,049,319

WHEEL CONSTRUCTION

Richard S. Hartung, Bedford, Pa., assignor to Hedstrom Co., Bedford, Pa.

Filed Mar. 18, 1976, Ser. No. 668,189
Int. Cl.² B60B *37/00*
U.S. Cl. 301—1 **6 Claims**

1. A wheel assembly comprising

A. a shaft,

B. at least one tab projecting radially out from the shaft and extending along the shaft so as to present an edge facing one end of the shaft,

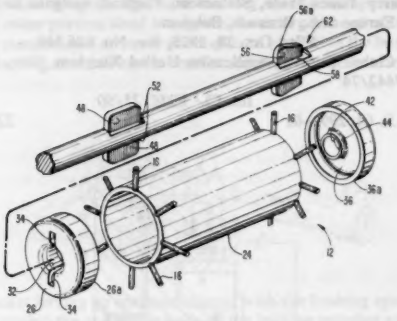
C. a wheel including a wheel hub composed of a tube whose bore cross-section is appreciably larger than that of the shaft and first and second end caps secured to the opposite ends of the tube,

D. means defining axial aligned openings in the end caps to accommodate the shaft,

E. a lip extending around the opening in at least the second end cap, said lip projecting into the hub, and

F. at least one slot contiguous with the opening in the first end cap, said slot being arranged and adapted to permit passage of the tab when said one end of the shaft is in-

serted through the openings in the first and then the second end caps, said shaft being positioned axially in the hub



so that said tab edge has sliced into the lip around the opening in the second end cap thereby rotatively locking the hub to the shaft.

4,049,320

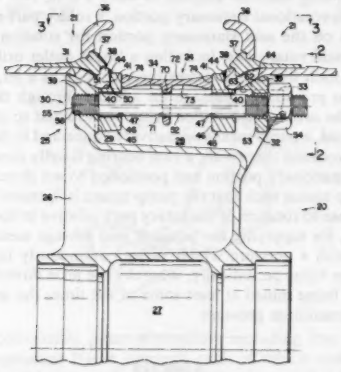
VEHICLE WHEELS, SPACERS AND DUAL RIMS

Robert A. DeRegnaucourt, Centerville; John C. Hall, Moraine, and Freddie R. Caudill, Dayton, all of Ohio, assignors to Dayton-Walther Corporation, Dayton, Ohio

Filed July 9, 1975, Ser. No. 592,506

Int. Cl.[2] B60B *23/10*

U.S. Cl. 301—13 SM **4 Claims**



1. A combination of dual inner and outer tire carrying rims separated by spacers and seated and locked by fastening assemblies on a vehicle wheel,

said wheel having a plurality of spaced-apart felloe portions, each said felloe portion having an outwardly opening pocket thereon, the axially inner end of each said pocket terminating at a radially directed surface substantially perpendicular to the rotational axis of said wheel and providing a mounting location for an elongated axially projecting component of said fastening assemblies, each said radially directed surface intersecting a radially inclined felloe surface, the axially outer end of each said pocket having spaced-apart axially directed wing portions providing for outwardly facing dual axially oriented surfaces extending substantially parallel to the rotational axis of said wheel,

each said rim having a rim base edge portion with a radially inclined axially inner surface intersecting an axially oriented radially inner surface intersecting a radially directed axially outer surface and a plurality of clamp lugs integrally secured to said radially directed axially outer surface, each said clamp lug having a radially inwardly directed leg portion substantially perpendicular to the rotational axis of each of said rims with a bore therein for receiving said elongated axially projecting component of said fastening assemblies,

each said spacer being non-compressible and comprising an individual element for each said wheel felloe portion with a bore therein for receiving said elongated axially projecting component of said fastening assemblies and being retained thereby between said rims,

each said fastening assembly comprising a threaded fastener and a clamp element supported by said threaded fastener, each said clamp element having lateral wing portions providing downwardly facing dual axially oriented surfaces, an axially inwardly directed member and a radially outer portion with a radially inclined surface,

whereby, said rims when separated by said spacers are seated and locked on said wheel solely by tightening of each said fastening assembly,

said radially inclined axially inner surface of said inner rim base edge portion being in mating engagement with each said radially inclined felloe surface, and said radially directed leg portion of one of said inner rim clamp lugs being in mating engagement with each said radially directed pocket surface,

the axially inner end of each said spacer being in mating engagement with said radially directed leg portion of one of said inner rim clamp lugs, the axially outer end of each said spacer being in mating engagement with said radially directed leg portion of one of said outer rim clamp lugs,

said radially inclined surface on each said clamp element on each said fastening assembly being in mating engagement with said radially inclined axially inner surface of said outer rim base edge portion, said downwardly facing dual axially oriented surfaces on said lateral wing portions of each clamp element on each said fastening assembly being in mating engagement with said outwardly facing dual axially oriented surfaces on said axially outer end of said felloe pocket and said axially inwardly directed member on each said clamp element on each said fastening assembly being in mating engagement with said radially directed leg portion of one of said outer rim clamp lugs.

4,049,321

WASTE COLLECTION SYSTEMS

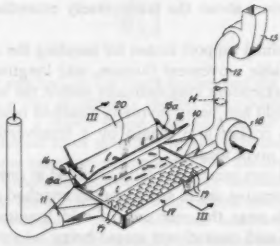
Keith Brian Bunting, Hazel Grove, England, assignor to Simon Container Machinery Limited, Stockport, England

Filed Feb. 9, 1976, Ser. No. 656,200

Claims priority, application United Kingdom, Feb. 20, 1975, 7256/75

Int. Cl.[2] B65G *53/40*

U.S. Cl. 302—41 **7 Claims**



1. Apparatus for the removal of waste material produced from a manufacturing operation comprising a box into which the waste material may be fed, said box having a top opening through which said waste material may be introduced, lid means for the box mounted to be movable between a box-open position wherein it uncovers said opening and a box-closed position wherein it closes said opening, means whereby said lid means in box-closed position accummulates waste material and whereby said accummulated waste material is introduced

through said opening into said box when said lid means is moved from box-closed to box-open position, and means for establishing a current of conveying air through said box when said lid means is in said box-closed position.

4,049,322

VEHICLE BRAKING SYSTEMS

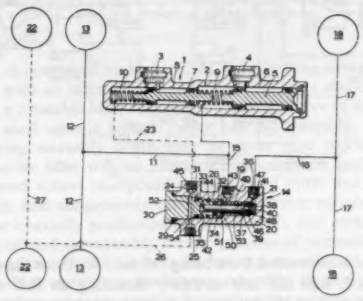
Glyn Phillip Reginald Farr, Leek Wootton, England, assignor to Girling Limited, Birmingham, England

Filed July 30, 1976, Ser. No. 710,221

Claims priority, application United Kingdom, Aug. 14, 1975, 33850/75

Int. Cl.² B60T *8/26, 8/22*

U.S. Cl. 303—6 C **8 Claims**



1. A pressure reducer valve assembly for a vehicle braking system comprising a housing, said housing having means defining first and second inlets for connection to first and second pressure spaces of a master cylinder and means defining an outlet for connection to a rear wheel brake, said housing being provided with a bore, a valve member positioned in said bore, a valve seat of which opposite sides communicate with said first inlet and said outlet, resilient means urging said valve member away from said seat, a pressure responsive member for controlling the position of said valve member, pressure at said first inlet acting on said pressure responsive member so as to urge said valve member towards said seat, abutment means for said resilient means, and means for controlling the position of said abutment means in response to the difference in pressure at said first and second inlets, means being provided for transmitting increase of pressure in said first pressure space up to a threshold value by said reducer valve assembly directly to said outlet to said rear wheel brake, said means transmitting said increases in pressure at pressures above said threshold value at a reduced rate, and said pressure reducer valve being responsive to the difference in pressure between said first and second inlets connected to said pressure spaces and including means for reducing said threshold value upon failure of the pressure at said second inlet.

4,049,323

BRAKE PRESSURE CONTROL VALVES WITH FLUID PRESSURE RESPONSIVE VALVE

Wolfgang Hess, Koblenz, Germany, assignor to Girling Limited, Birmingham, England

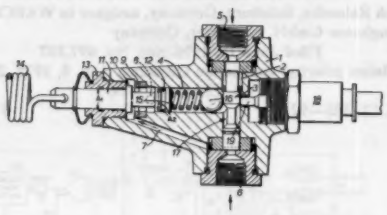
Filed Feb. 19, 1975, Ser. No. 550,996

Claims priority, application United Kingdom, Feb. 20, 1974, 7802/74

Int. Cl.² B60T *8/18, 8/26*

U.S. Cl. 303—6 C **5 Claims**

1. A pressure control valve assembly for use in vehicle braking system having separate pressure circuits, comprising a fluid pressure responsive valve adapted to be inserted in one of said circuits for controlling the flow of pressure fluid therein, the valve having a valve closure member and a cooperating valve seat, spring means urging said valve to an open position, a pressure differential responsive member adapted to be subjected at opposed ends respectively to the pressures in said circuits and normally occupying a first position, and force varying means having an operative connection with said spring means and with said pressure differential responive member for varying the force with which the spring means acts on said valve, and therefore the pressure at which said valve responds, when said pressure differential responsive member is moved from its first position to a second position in response to a



pressure differential in said circuits, said force varying means comprising an adjustable abutment which is movable between a normal position and an actuated position in direct consequence of actuating movement of said pressure differential responsive member, means defining a first bore within which said abutment is movable and means defining a second bore extending transversely to said first bore within which said pressure differential responsive member is movable.

4,049,324

ELECTRO-PNEUMATIC EMERGENCY BRAKE CONTROL SYSTEM FOR A VEHICLE TRAIN

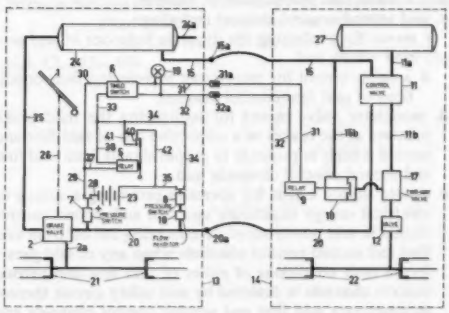
Eduard Cermak, Haydnstrasse 6, 71 Heilbronn, Germany

Filed Nov. 17, 1975, Ser. No. 632,397

Claims priority, application Germany, May 28, 1975, 2420665

Int. Cl.² B60T *13/16*

U.S. Cl. 303—7 **4 Claims**



1. A brake system for a vehicle train including a tractor and a trailer which comprises:

a. a source of high pressure connected through a control line to operate a pneumatic brake system in a tractor vehicle and in a trailer vehicle,

b. an electric circuit which, when closed, electrically opens a valve to supply high pressure air directly to the brake system in said trailer vehicle,

c. a fast-acting pressure switch on said tractor vehicle and in said electric circuit, said fast-acting switch acting responsive to a particular pressure in said control line to close said electric circuit,

d. a slow-acting pressure switch on said tractor vehicle and in said electric circuit, said slow-acting pressure switch acting responsive to a pressure in said control line that is

lower than said particular pressure to open said electric circuit, and

e. means actuated when both said fast-acting switch and said slow-acting switch are closed to by pass said slow-acting switch.

4,049,325

SAFETY CIRCUIT ARRANGEMENT FOR WHEEL ANTI-SKID BRAKE CONTROL SYSTEM

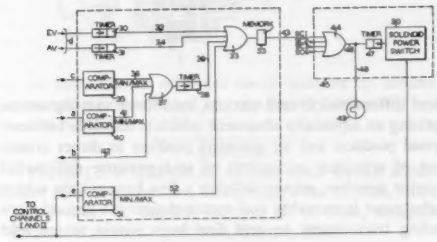
Erich Reinecke, Beinhorn, Germany, assignor to WABCO Westinghouse GmbH, Hannover, Germany

Filed June 18, 1976, Ser. No. 697,337

Claims priority, application Germany, Aug. 5, 1975, 2534904

Int. Cl.² B60T *8/00*

U.S. Cl. 303—92 **5 Claims**



1. An anti-skid control system for the fluid pressure operated brakes of a road vehicle having at least two wheels, comprising:

a. first and second electronic control channels for a first and second one of said wheels, respectively, each said control channel being of integrated circuit construction formed on separate integrated circuit chips;

b. said first control channel including:

i. means for evaluating the dynamic behavior of said first wheel; and

ii. a safety circuit for monitoring preselected fault conditions of said second control channel;

c. said second control channel including:

i. means for evaluating the dynamic behavior of said second wheel; and

ii. a safety circuit for monitoring preselected fault conditions of said first control channel;

d. modulator valve means for influencing the fluid brake pressure at the brakes of a respective one of said first and second wheels in response to output signals from said first and second control channels; and

e. power supply means for normally providing a source of electrical energy to activate said first and second control channels, said power supply means being cut off from said first and second control channels when any of said preselected fault conditions of either of said first and second control channels is detected by said safety circuit thereof to deactivate said first and second control channels and thereby inhibit operation of said anti-skid brake control system.

4,049,326

FAIL SAFE CIRCUIT FOR AN ANTI-SKID CONTROL APPARATUS

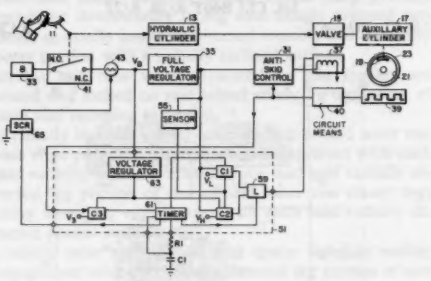
Don W. Zobel, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 14, 1975, Ser. No. 631,804

Int. Cl.² B60T *8/08*

U.S. Cl. 303—92 **2 Claims**

1. In the anti-skid control apparatus for an automobile brake system adapted to operate with the brake system of an automobile and prevent it from skidding with an actuable valve operatively coupled to a brake shoe for applying brake force against a wheel of the automobile in motion to slow it down and an anti-skid control circuitry controlling the operation of the actuable valve for applying brake forces against the wheel in a controlled manner to avoid skidding, said anti-skid control circuitry including means for sensing the rate of deceleration of the moving wheel and providing an output signal when the rate exceeds a predetermined rate indicative of skidding conditions and means for deactuating the valve to release the brake shoe in response to the output signal to prevent skidding, the improvement which comprises fail safe circuitry for actuating the valve when the brake shoe is released by said anti-skid control circuitry for a predetermined time period whereby the



brake shoe is prevented from being released for more than said time period, said fail safe circuitry including an R-C timer adapted to have applied thereto a regulated voltage, said timer including a timing capacitor coupled to the regulated voltage and through additional circuitry providing an actuating signal to the valve when the voltage stored in said timing capacitor reaches a predetermined value, and semiconductor means coupled across said timing capacitor for discharging said capacitor before the voltage stored therein reaches the predetermined value when the regulated voltage dips below a predetermined amount.

4,049,327

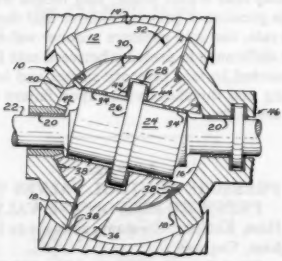
THRUST BEARING

Alexander Goloff, East Peoria, and Frank E. Keske, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 3, 1975, Ser. No. 628,024

Int. Cl.² F16C *32/00*

U.S. Cl. 308—161 **11 Claims**



1. A thrust bearing comprising:

first and second relatively rotatable members;

one of said members including a thrust collar;

the other of said members including a groove receiving said thrust collar; and

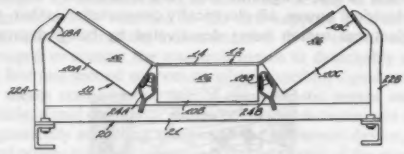
means defining a bearing surface at the interface of said thrust collar and said groove;

said collar, groove and bearing surface being constructed and arranged such that clearance between the parts may vary in the radial direction.

4,049,328
SUBASSEMBLY CARTRIDGE FOR SEALING AND ADJUSTING BEARING ASSEMBLIES

Ralph C. Ouska, Hinsdale, and Francois X. Bertaud, Aurora, both of Ill., assignors to Stephens-Adamson, Inc., Aurora, Ill.

Filed May 25, 1976, Ser. No. 689,938
Int. Cl.[2] F16C 33/72
U.S. Cl. 308—187.1 19 Claims



1. A combined bearing sealing and adjusting subassembly for use with an idler roll assembly comprising a stationary shaft and a rotatable idler roll which rotates relative to said stationary shaft upon a tapered roller bearing assembly, said roller bearing assembly comprising an outer race carried by said rotatable idler roll, an inner race mounted on said shaft and tapered rollers interposed between said outer and said inner races, said subassembly comprising a sleeve member adapted to be coaxially positioned upon said shaft, seal means forming part of said subassembly for the purpose of normally preventing egress of lubricant from the bearing assembly or the ingress of foreign matter into the bearing assembly, an axially inwardly extending retaining portion formed on the axially inner end of said sleeve member, a plastically and elastically deformable collapsible spacer member adapted to be retained by said retaining portion of said sleeve member, said spacer member being characterized by the fact that it is plastically deformable to absorb manufacturing clearances of said idler roll assembly within a predetermined range of travel of said spacer member and is also elastically deformable over the same range, and that for any plastic deformation within a given range of travel for which the spacer member is designed, a substantially constant elastic deformation is available, the elastic deformation characteristic of said spacer member serving to provide a predetermined adjustment of the tapered roller bearing assembly, said sleeve member being movable axially inwardly relative to said idler roll assembly along said shaft whereby to plastically and elastically deform said spacer member, means defining a bearing surface for said spacer member interposed between the axially inner end of said spacer member and said inner race of said roller bearing assembly, and means carried by said sleeve member and adapted to cooperate with means on said shaft whereby to permit a predetermined axially outward movement of said sleeve member along said shaft subsequent to the deformation of said spacer member whereby to permit a controlled release of a predetermined proportion of the elastic deformation of said spacer member and thus whereby to control the adjustment of said tapered roller bearing assembly.

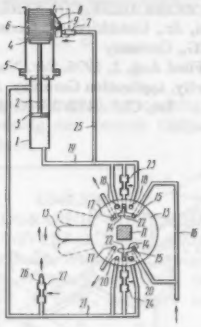
4,049,329
AUTOMATIC DEVICE FOR MAINTAINING THE LEVEL OF A STACK OF PLATES

Ivan Alexandrovich Kolosov, ulitsa Astrakhanskaya, 118, kv. 54, Saratov, U.S.S.R.

Filed Sept. 9, 1976, Ser. No. 721,709
Claims priority, application U.S.S.R., Sept. 10, 1975, 2172467
Int. Cl.[2] A47F 1/00
U.S. Cl. 312—71 1 Claim

1. An automatic device for maintaining the level of a stack of plates, mainly of the storage-battery type, in feeding devices of automatic assembly machines, comprising:

a source of fluid under pressure; a mechanism for lifting the stack made in the form of a conventional pneumatic cylinder with both chambers thereof communicating through conduits with said compressed-fluid source; a replaceable magazine with a stack of plates mounted on said cylinder; and a control system for maintaining the level of a stack of plates including a distributing valve having a member with T-grooves made on one of its end faces, said grooves placing said conduits in communication with said compressed-fluid source; throttles placed in said conduits; stack-level sensing means in the form of a nozzle and a baffle, said baffle being adapted to engage the uppermost plate of the stack in said replaceable magazine and said nozzle being connected by its inlet to one of said conduits

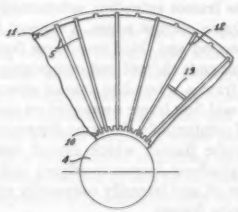


and thereby to one chamber of said cylinder; another nozzle connected to another of said conduits and thereby connected to the other chamber of said cylinder, said nozzles thus providing for simultaneous discharge therethrough of the compressed fluid from both chambers of said cylinder to the atmosphere, as said baffle, associating with one of said nozzles, interacts with the uppermost plate of the stack, the level of said stack in said replaceable magazine being thereby automatically maintained.

4,049,330
STORAGE FACILITY

Wilhelm Schlapp, Schulstr. 8, D-6392 Neu-Anspach 1, Germany

Filed Mar. 24, 1976, Ser. No. 669,807
Int. Cl.[2] A47B 63/00; A47F 1/00
U.S. Cl. 312—186 7 Claims



1. Storage facility for papers, files, forms or other objects, comprising:

a hollow storage drum being open on at least one side and including at least two concentric surfaces with means for insertion of partitions at opposite sides;

variably positionable and removable, radially extending partitions inserted in the means of the two surfaces for compartmentizing the interior of the drum;

means for mounting the drum for rotation on a horizontal axis;

an enclosure having at least one slot for access to a compartment of the drum when aligned with the slot;

means connected to the drum for driving the drum;

encoding indicia on the drum for identifying compartments thereof;

scanning means for reaching the indicia and providing reading signals representative thereof;

input means for providing select signals identifying compartments; and

comparing means connected to be responsive to the reading signals and the select signals and controlling the means for driving to stop the drum in a particular position upon agreement of the compartments as identified by the indicia as read and by the input means.

4,049,331

WORK DESK CONSTRUCTION

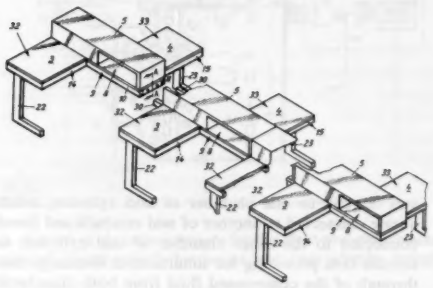
Karl Gutmann, Jr., Unterkirnach, Germany, assignor to Karl Gutmann KG., Germany

Filed Aug. 2, 1976, Ser. No. 710,367

Claims priority, application Germany, Aug. 16, 1975, 2536460

Int. Cl.² A47B *53/00, 87/00*

U.S. Cl. 312—203 **12 Claims**



1. A work desk construction particularly for typists, comprising a longitudinally extending rectangular first support frame having a pair of longer sides joined by a pair of narrow edges and defining a flat top case support, second and third laterally offset transverse frames each having a pair of longer sides joined by a pair of narrow edges and connected into said first frame at spaced locations from each longitudinal end of said first frame and extending transversely outwardly in respective opposite directions from said first frame at longitudinally offset locations with the longer sides of said second and third transverse frames extending substantially parallel to said first support frame narrow edges, a support leg connected to each of said second and third transverse frames adjacent the outer transverse ends thereof and comprising the sole support for all of said frames, a box-like case of substantially the same dimensions as said first frame supported on said first frame, and a desk plate of substantially the same dimensions as the portion of said transverse frames which extend laterally outwardly from said longitudinal frames overlying and supported upon respective ones of said laterally outwardly extending portions of said transverse frames.

4,049,332

IRONING BOARD CABINET

Bettie M. Boudreaux, 839 Claiborne Towers, 119 S. Claiborne Ave., New Orleans, La. 70112

Filed Dec. 12, 1975, Ser. No. 640,016

Int. Cl.² A47B *77/08, 83/00*

U.S. Cl. 312—237 **4 Claims**

1. An ironing board cabinet comprising:

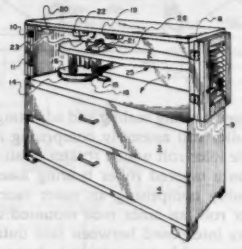
a structure defining a horizontally extended, box-like, generally open space located at the front and at the upper level of the cabinet;

door means located along the front of said open space for closing off said open space, said door means comprising doors hinged to open laterally out from the center front of said open space to the side ends of said open space to expose said open space;

a 90° pivot mount located to one side of said open space near one end thereof;

a horizontally 90° swingable ironing board secured by said pivot mount to and near one end of the bottom side of said box-like open space, the length and width of the ironing board being completely containable within said open space when said ironing board is located therein; and

electrical circuitry located in the cabinet including an electrical switch, a light, an iron plug outlet, and a source of electrical power, all electrically connected together, said electrical switch being deactivated by being depressed



and being located in the front portion of said open space, said door means activating said switch when said door means are moved from the closed position to the open position, said switch being electrically connected to said electrical power source, said light and said iron plug outlet so that when said door means is opened, the switch is activated, thereby activating the light and said iron plug outlet, said light being located at the top and at the front of said open space and focused to place light on the operational area of said ironing board when the door means is opened and the ironing board is pulled out of said open space 90° to its operating position.

4,049,333

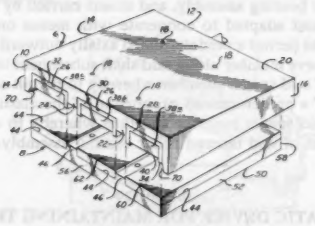
MAGNETIC RADIO MOUNTING BRACKET

Dewey K. Wallace, 812 Wateka, Richardson, Tex. 75080

Filed Mar. 31, 1976, Ser. No. 672,186

Int. Cl.² H01R *11/30*

U.S. Cl. 339—12 R **10 Claims**



1. Means for detachably and electrically connecting an electronic device in a vehicle comprising: a first support arranged for attachment to a vehicle; first, second and third magnetic means attached to the support; power means attached to the first magnetic means; ground means attached to the second magnetic means; antenna signal means attached to the third magnetic means; a second support arranged for attachment to an electronic device; first, second, and third magnetically attracting means attached to the second support; said first, second, and third magnetic means being arranged for attachment to the respective first, second and third magnetically attracting means to provide electrical connection therebetween corresponding to the electrical connections to the first,

second, and third magnetic means; first, second, and third electrical connector means connected to the first, second and third magnetically attracting means, means connecting the first, second, and third connector means to a power supply, ground and antenna signal connections in the electronic device.

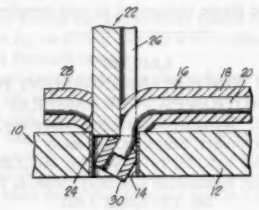
10. Means for detachably and electrically connecting an electronic device in a vehicle comprising: a first support arranged for attachment to the vehicle; a second support member arranged for attachment to an electronic device; at least three magnetic means attached to the first support; at least three magnetically attracting means attached to the second support arranged to contact the magnetic means to detachably attach the first and second support members together; signal conductor means connected to one of the magnetic means and the vehicle; signal conductor means connected between one of the magnetically attracting means and the electronic device; electrical power connection means attached to two of the magnetic means and arranged for attachment to the electrical system in the vehicle; and electrical power connection means attached to two of the magnetically attracting means aligned with the two corresponding magnetic means and arranged for attachment to the electrical supply means in the electronic device.

4,049,334

WIRE PREPARATION AND TERMINATION MEANS AND METHOD

Dennis C. Siden, Portola Valley, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 28, 1976, Ser. No. 653,010
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—97 R **18 Claims**



1. A termination assembly for an insulated conductor comprising

a circuit board having a termination hole therein with which an insulated conductor is to be terminated;

an elongate pin sized to fit, in interference, in said receiving termination hole, said pin being of generally uniform transverse cross-section along the length thereof and having a first channel extending longitudinally along a side thereof, said first channel having a first cross-sectional dimension smaller than the diameter of the insulated conductor and sized for interference fit with the cross-section of the conductor when stripped of insulation.

4,049,335

SEALED BATTERY THREADED STUD TERMINATION

Victor J. Julian, 2400 Bellvue, Westchester, Ill. 60153, and Kenneth A. Julian, 769 Oakwood Drive, Westmont, Ill. 60559

Filed Jan. 10, 1977, Ser. No. 727,405
Int. Cl.[2] H01R *11/26*
U.S. Cl. 339—224 **10 Claims**

1. A termination for connecting an electric cable to a shouldered terminal stud of a battery, comprising

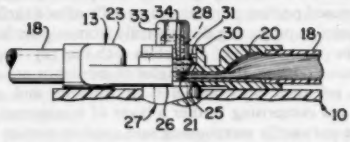
a tubular conductive member surrounding a portion of said cable,

said tubular member having top and bottom flat surfaces,

said surfaces and said cable being provided with aligned holes therethrough for receiving said stud,

a plastic cover molded directly over said tubular member and having top and bottom openings aligned with said holes,

said bottom opening being sufficiently large to receive at least the upper portion of the shoulder on said stud, and



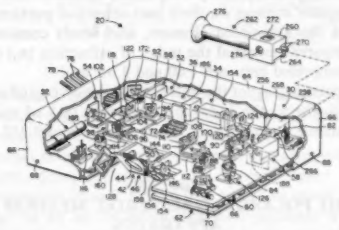
fastening means disposed in said top opening for engaging said stud and holding said bottom flat surface tightly against said shoulder.

4,049,336

PULSED HOLOGRAPHIC SYSTEM HAVING INDEPENDENT UNIVERSAL BEAM ADJUSTMENT

Jerold L. Jacoby, Long Beach; William S. Tierney, Palos Verdes Peninsula; James E. Wright, Long Beach, and Pravin G. Bhuta, Torrance, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed July 24, 1975, Ser. No. 598,901
Int. Cl.[2] G03H *1/02;* G02B *7/02;* G03B *5/06*
U.S. Cl. 350—3.5 **30 Claims**



1. A holographic recording unit comprising;

a mounting base,

holographic recording means on said base including means for producing coherent holographic scene and reference beams, directing said scene beam outwardly from said recording unit along an external scene beam path to illuminate a subject situated in said path, and directing said reference beam along a reference beam path, and means for positioning a holographic recording medium in holographic recording relation to said beam paths wherein the medium is disposed for illumination both by said reference beam and by reflected scene beam light from the subject, and means for adjusting said beam paths and positioning means in unison in such a way as to maintain a fixed relation between said beam paths and the recording medium.

4,049,337

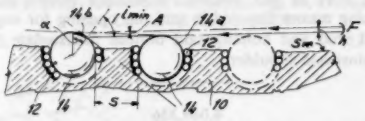
REFLEX REFLECTING SYSTEM FOR ROAD SURFACE MARKING

Ludwig Eigenmann, Vacallo, Cantin Ticino, Switzerland

Continuation-in-part of Ser. No. 428,909, Dec. 27, 1973, Pat. No. 3,964,821. This application May 19, 1976, Ser. No. 687,698
Claims priority, application Italy, Dec. 28, 1972, 33710/72
The portion of the term of this patent subsequent to June 22, 1993, has been disclaimed.
Int. Cl.[2] G02B *5/128*
U.S. Cl. 350—105 **8 Claims**

1. On a marked road roadway pavement, a traffic-regulating

indicium including a layer of material having a upwardly facing surface the entire extent of which is approximately planar, wherein a substantial surface area of said surface includes a discrete number of reflective aggregates partially embedded in said layer, at least a part of said aggregates comprising each a substantially spherical transparent element having an exposed portion projecting upwardly of said surface and another portion projecting downwardly from said surface, said element having an index of refraction such that rays impinging said exposed portion at large angles of incidence are at least partially refracted into said element towards said another portion, and comprising further a layer of transparent binder substance outwardly surrounding said another portion of said element, and reflecting means for the reflection of rays refracted into said element associated with said other portion of said element and spaced from the same by said binder substance, provided that:



a. said transparent element consists of a transparent polymeric substance the index of refraction (n_1) of which is comprised between 1.45 and 1.68,

b. said reflecting means consist of transparent beads partially embedded into said layer of binder substance and having a reflective coating on their part-spherical portions spaced from the associated element, said beads consisting of a transparent material the index of refraction (n_3) of which is comprised between 1.60 and 1.95; and

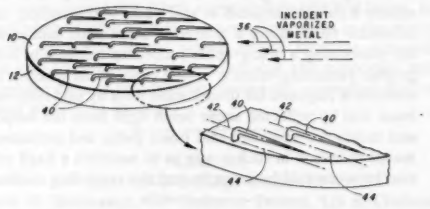
c. the ratio (n_3/n_2) of the index of refraction (n_3) of said beads relatively to the index of refraction (n_2) of said binder substance is comprised between 1.135 and 1.385.

4,049,338

LIGHT POLARIZING MATERIAL METHOD AND APPARATUS

Robert E. Slocum, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 525,232, Nov. 19, 1974, Pat. No. 3,969,545, which is a continuation-in-part of Ser. No. 337,046, March 1, 1973, abandoned. This application May 3, 1976, Ser. No. 682,285
Int. Cl.² G02B *5/30*
U.S. Cl. 350—152 **4 Claims**



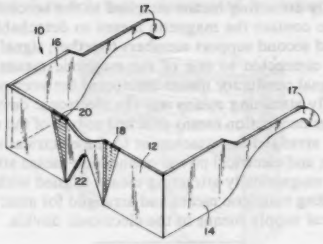
1. A light polarizer comprising a transparent substrate of sheet material having a surface which is microscopically smooth to eliminate shadowing effects and having a plurality of nucleating sites distributed randomly throughout the microscopically smooth surface, and a plurality of particles each having one end attached to a nucleating site and an elongated body unattached to the surface and oriented substantially in one given direction, the plurality of particles forming a plurality of side by side essentially parallel whiskers having a length at least as long as one wavelength of incident light to be transmitted and a diameter and separation less than the wavelength of light to be polarized whereby a discontinuous film is formed which acts as a polarizer for both reflected and transmitted light.

4,049,339

MOVIE VIEWING EYEGLASSES

Antoine Ledan, 417 E. 93rd St., Brooklyn, N.Y. 11212

Filed Feb. 20, 1976, Ser. No. 659,717
Int. Cl.² G02C *7/16*; G02B *27/02*
U.S. Cl. 351—45 **5 Claims**



1. A pair of eyeglasses for use in viewing a movie screen to provide depth simulation comprising:

a frame formed from opaque material, having a nose piece,

a temple formed from opaque material hingedly connected to each end of said frame, and

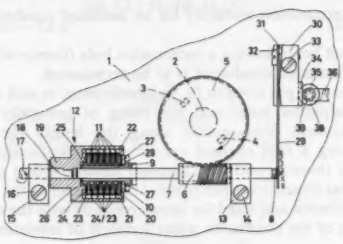
a pair of transparent, triangular lenses in the plane of said frame on opposite sides of said nosepiece spaced from the ends of said frame connected to said temples.

4,049,340

FILM WIND-UP ARRANGEMENT FOR MOTION-PICTURE CAMERAS

Fritz Krumbein, Stuttgart-Mohringen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 25, 1976, Ser. No. 661,335
Claims priority, application Germany, Mar. 5, 1975, 2509492
Int. Cl.² G03B *1/00*
U.S. Cl. 352—166 **15 Claims**



1. In a motion-picture camera, in combination, a prime mover; a film wind-up member; and a torque-equalizing clutch arrangement coupling the film wind-up member to the prime mover for transmitting torque to the latter, the clutch arrangement including automatic wind-up torque regulating means operative for continually maintaining the wind-up torque transmitted to and exerted by the film wind-up member substantially constant at a preselected value throughout the whole film wind-up operation by automatically disengaging the clutch arrangement when the wind-up torque begins to exceed the preselected value and automatically reengaging the clutch arrangement when the wind-up torque then begins to fall below the preselected value, so as to establish transmission of an intermittent wind-up torque having an average value which is substantially constant and equal to the preselected value, the

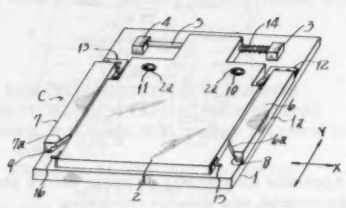
automatic wind-up torque regulating means including a worm wheel connected to and driving the film wind-up member, a worm screw driving the worm wheel and driven by the disengageable part of the clutch arrangement, the worm screw being so mounted that as it drives the worm wheel it simultaneously tends to move in a direction causing the disengageable part of the clutch arrangement to become disengaged, and biasing means for exerting upon the worm screw a force counteracting the tendency to move in such direction.

4,049,341

FILM CARRIER FOR MICROFILM READER

Shiro Toriumi, Machida, and Seiichi Yamagishi, Tokyo, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 16, 1976, Ser. No. 677,654
Claims priority, application Japan, Apr. 23, 1975, 50-56224
Int. Cl.[2] G03B *1/48, 21/14*
U.S. Cl. 353—23 **13 Claims**



1. A carrier device for a microfilm reader comprising:

a base plate for receiving thereon a microfilm, said base plate having a forward border

a transparent holding plate having a forward end and being pivoted for swinging about a transverse axis proximate its forward end to the forward border of said base plate, for holding the microfilm tight on the base plate when said holding plate is in closed substantially superimposed position relative to said base plate, said base plate and said holding plate being movable as a unit in a planewise direction,

a pair of guide members fixed on both sides of the base plate and each having a slant notch and a groove running diagonally forwardly inwardly to converge in the direction of movement of the microfilm insertion, said groove running parallel with said slant notch and formed along the bottom of said slant notch, said guide members controlling the sidewise positioning of the microfilm on the base plate upon insertion of the microfilm fed between said base plate and said holding plate.

4,049,342

MICROFICHE CARTRIDGE AND TRANSPORT APPARATUS

Guy Head Hearon, Malibu, Calif., assignor to Dymat Photomatrix Corporation, Santa Monica, Calif.

Filed June 7, 1976, Ser. No. 693,524
Int. Cl.[2] G03B *23/08*; B65H *29/00, 5/00*
U.S. Cl. 353—27 R **2 Claims**

1. A microfiche cartridge and transport apparatus for moving a selected microfiche onto a receiving platen of a microfiche viewer, including, in combination:

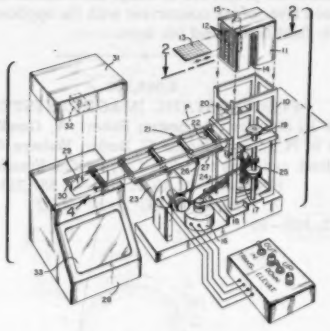
a. an open top frame structure;

b. a box shaped cartridge having a series of elongated rectangular pockets in a stacked array, one above the other, with exposed front openings, each pocket being dimensioned to receive in its front opening a single microfiche, opposite sides of said box shaped cartridge having vertical cut-out channels intersecting opposite sides of said pockets to expose opposite edge portions of each microfiche when stored in the pockets, said box shaped cartridge being receivable in the open top of said frame for guided movement in an up and down direction;

c. a first reversible motor means for raising and lowering said cartridge within said frame in discrete increments corresponding to the vertical spacing between adjacent pockets;

d. friction wheels mounted for rotation about vertical axes and lying in a horizontal plane on opposite sides of said frame, peripheral portions of said wheels being received in said cut-out channels to engage the opposite edges of a microfiche contained in a pocket positioned in said horizontal plane;

e. a conveyor means including drive rollers supported by said frame at the front opening of that pocket in said horizontal plane, said conveyor means extending at its far end to said platen and including a return transport initiating means in the form of a friction roller overlying but not normally engaging a trailing edge portion of a microfiche when fully positioned on said platen; and,



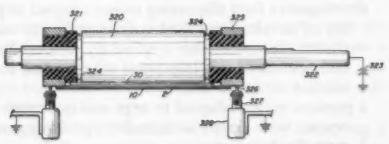
f. a second reversible motor means for rotating said friction wheels, drive rollers and said friction roller whereby energization of said first motor means to move said cartridge in an up or down direction positions a selected pocket and its associated microfiche in said horizontal plane, energization of said second motor means in one direction transporting said microfiche from said pocket onto said conveyor means and onto said platen, and energization of said second motor means in a reverse direction causing said friction roller to engage said microfiche and feed it back onto the main portion of said conveyor means for return to said pocket by said main drive rollers and friction wheels.

4,049,343

COMBINATION IMAGING AND GROUNDING ROLLER

Herman A. Hermanson, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 24, 1975, Ser. No. 571,174
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 P **4 Claims**



1. A photoelectrophoretic apparatus having in combination

a. an injecting web electrode;

b. a blocking web electrode which is narrower in width than said injecting electrode;

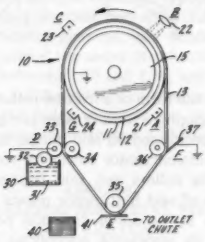
c. means for deposition of a thin film of ink on at least one of said electrodes;
d. means for synchronous advancement of said electrodes;
e. means for confining of said ink film between said electrodes in an imaging zone;
f. means for support of said web electrode in said imaging zone, said support means comprising a roller having a first conductive surface in contact with that portion of the blocking electrode substantially corresponding to the imaging zone and a second conductive surface in contact with that portion of the injecting electrode substantially outside of the imaging zone, each of the conductive surfaces in contact with the blocking web electrode and the injecting web electrode being electrically biased so as to create an electric field across the layer of ink confined between said electrodes; and
g. means for projection of image information onto the confined layer of ink concurrent with the application an electric field across said ink layer.

4,049,344

ELECTROSTATIC IMAGING SYSTEM

George R. Simpson, Rochester; Robert W. Gundlach, Victor, both of N.Y., and Gordon C. Butler, Welwyn Garden City, England, assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 10, 1975, Ser. No. 557,213
Int. Cl.[2] G03G *13/10, 13/22*
U.S. Cl. 355—10 **17 Claims**



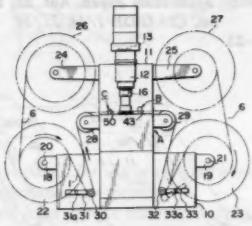
9. An apparatus for electrostatically reproducing a selected image comprising:
a rotatable photoconducting drum;
endless interposer means belted about said drum and adapted to movably contact portions thereof;
first charge means for applying a first charge of a selected polarity to an area of said drum;
optical means for applying a light and shadow representation of said selected image to said area to said drum;
second charge means for applying a second charge of opposite polarity from said first charge, to a portion of said interposer means in contact with said area of said drum, the second charge being retained on the interposer according to the light and shadow representation and the first charge effectively transferring from the photoconducting drum to the interposer when the interposer moves out of contact with the drum;
development fluid dispensing means adapted to pass a quantity of development fluid corresponding to said light and shadow representation applied by said optical means to said portion of said interposer means when moved out of contact with said drum;
a pressure roller, adapted to urge said interposer means into contact with a copy medium for transferring said development fluids thereto;
discharge means adapted to remove residual charges of said first charge from said drum prior to the application of another light and shadow representation on said area of said drum; and
means for removing excess development fluid from said interposer means after said image is reproduced on a copy medium.

4,049,345

APPARATUS FOR EXPOSING A PHOTOSENSITIVE BELTLIKE MATERIAL

Osamu Tanabe, Hikone; Hisao Nishizawa, Shiga, and Kazuo Hata, Kameoka, all of Japan, assignors to Dainippon Screen Seizo Kabushiki-Kaisha, Kyoto, Japan

Filed Mar. 31, 1976, Ser. No. 672,383
Claims priority, application Japan, Apr. 3, 1975, 50-39798
Int. Cl.[2] G03B *27/52, 27/32*
U.S. Cl. 355—41 **5 Claims**



1. Apparatus for exposing an image onto a photosensitive beltlike material, said appartus comprising:
a light source to illuminate an original pattern block,
an optical system to cast and focus an image of said pattern block,
exposure control means to control the focusing and the exposing of said optical system,
conveying means to intermittently convey said beltlike material onto the focal plane of said optical system,
detecting means, being subject to a lateral movement of said beltlike material, to detect its amount of movement, thereby controlling said conveying means,
supporting means to support and position said beltlike material at said focal plane,
first rotating member having both said beltlike material and a beltlike protecting means wound therearound in advance,
a second rotating member,
a third rotating member having another beltlike protecting means wound therearound in advance, and
a fourth rotating member;
said fourth rotating member being adapted to receive said beltlike protecting means wound off from the first member, and said second rotating member being adapted to receive both said beltlike material from the first member and another beltlike protecting means from the third member.

4,049,346

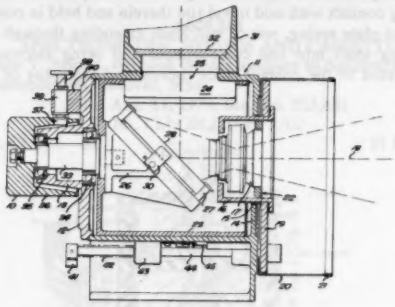
CAMERA PROJECTOR WITH TURRET

Cecil Alfred Austin, Crawley, England, assignor to Pictorial Machinery Limited, Crawley, England

Filed May 13, 1976, Ser. No. 686,079
Claims priority, application United Kingdom, May 23, 1975, 22826/75
Int. Cl.[2] G03B *27/70, 13/28*
U.S. Cl. 355—45 **8 Claims**

1. A photographic copying machine including a camera, an image projector and an image viewer mounted at respective locations, a lens system which is common to said camera, said projector and said viewer, and adjustable means, including a mirror mounted to be selectively movable between three posi-

tions in each of which said mirror is disposed in the path of light passing through said lens system and couples a respective



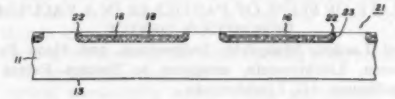
one of said camera, said projector and said viewer with said lens system.

4,049,347

SCRATCH-RESISTANT MASK FOR PHOTOLITHOGRAPHIC PROCESSING

Carlyle F. Smith, Jr., Cayuga, N.Y., assignor to General Electric Company, Auburn, N.Y.

Filed Mar. 24, 1976, Ser. No. 669,720
Int. Cl.[2] G03B *27/28*
U.S. Cl. 355—133 **3 Claims**



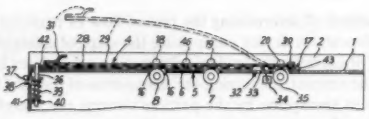
1. A photomask comprising a glass substrate having depressions formed in a major surface thereof and opaque ceramic masking material fused to said substrate in said depressions, wherein only a narrow peripheral portion of each body of said masking material is coplanar with said major surface, the remaining portion of the exposed surface of each of said bodies of masking material being depressed beneath the plane of said major surface.

4,049,348

PHOTOCOPYING APPARATUS

Yves Cormier, 17 rue Charles Morance, 72000 Le Mans, France

Filed Dec. 19, 1975, Ser. No. 642,604
Claims priority, application France, Dec. 23, 1974, 74.42435
Int. Cl.[2] G03B *27/62*
U.S. Cl. 355—50 **8 Claims**



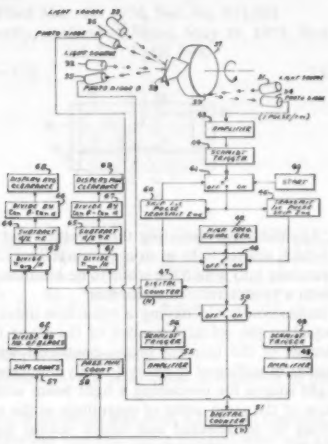
1. Photocopying apparatus having an inlet end and an outlet end, said apparatus serving to duplicate open books and linearly traveling single sheets comprising a horizontally arranged guide plate, laterally spaced longitudinally extending guide means disposed adjacent to said guide plate, an exposure window associated with said guide plate, primary rotatable feed rollers spaced inwardly of said inlet end of said apparatus, secondary rotatable feed rollers in proximity to said exposure window, a linearly movable carriage element having oppositely disposed lateral edges, means associated with said longitudinally extending guide means adapted to engage said lateral edges of said carriage, carriage retention control means positioned in proximity to said outlet end of said apparatus, and microswitch means in proximity to said primary feed rollers serving to close a circuit to cause said primary and secondary rollers to begin rotation.

4,049,349

DEVICE FOR MEASURING ROTOR TIP CLEARANCE IN OPERATING TURBOMACHINERY

Arthur J. Wennerstrom, 215 Mar-Ken Drive, Dayton, Ohio 45405

Filed June 30, 1976, Ser. No. 701,453
Int. Cl.[2] G01C *3/08*; G01P *3/48*
U.S. Cl. 356—4 **1 Claim**



1. Apparatus for measuring in an operating turbomachine clearance between a casing and blade tips of a revolving rotor having a circumferential direction and an axis of rotation, the said casing having a radius R from the said axis, the said apparatus comprising:

a. a pair of sensors comprising a first light source emitting a beam of light cooperating with a first light detector, and a second light source emitting a beam of light cooperating with a second light detector;

b. the said pair of sensors positioned circumferentially in spaced-apart relationship in the said casing where the said blade clearance is to be measured, and having equal axial coordinates with respect to the said axis of rotation, and the said light emitting sources angled to one another measured in a plane of revolution of said rotor containing both light beams and separated by a determined distance *d*;

c. means for detecting a revolution of the said revolving rotor;

d. a high frequency generator providing a stable frequency of pulses;

e. means cooperating with the said pair of sensors and the said high frequency generator providing a digital count *n* of pulses between the intercept of a blade with the said first light beam and the intercept of the blade with the said second light beam;

f. means cooperating with the said means for detecting a revolution of the revolving rotor and the said high frequency generator providing a digital count N of pulses occurring during the said revolution;

g. means for dividing the said *n* count by the said N count and providing a quotient of *n*/N;

h. means for subtracting from the quotient n/N the distance d divided by 2π times the said casing radius R and providing a digital output; and

i. means for displaying the said digital output.

4,049,350

PROCESS AND APPARATUS FOR DETECTING INCLUSIONS

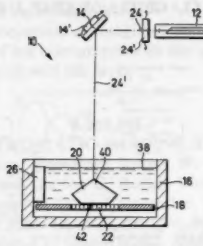
Gernot Klaus Brück, Cologne, Germany, assignor to DIHACO Diamanten Handels Compagnie Est., Mauren, Fla.

Filed Sept. 12, 1975, Ser. No. 612,925

Claims priority, application Germany, Sept. 18, 1974, 2444644

Int. Cl.² G01N *21/32*

U.S. Cl. 356—30 **26 Claims**



13. Apparatus for detecting the presence and size of inclusions which scatter light in stones, comprising:

a container into which the stone to be examined in insertable with a predetermined alignment;

an immersion liquid having a refractive index substantially equal to the refractive index of the stone for the wavelength of the incident beam, contained within the container in sufficient quantity to fully immerse the stone;

a light source for producing a light beam with a cross-section of the same order of magnitude as the smallest inclusions to be detected and which scatter light from said beam;

an adjusting device for aligning the beam in a particular direction relative to the stone when inserted in the container;

a moving device for relatively moving the stone and the beam to scan the light beam across the stone; and

means responsive to the intensity of unscattered light from said light beam to the exclusion of light scattered by inclusions for measuring the intensity of said unscattered light with respect to each relative position of the beam and the stone during the scan caused by said moving device.

4,049,351

CONTACT MEANS FOR A WEATHER RESISTANCE AND SOLAR RADIATION TESTER

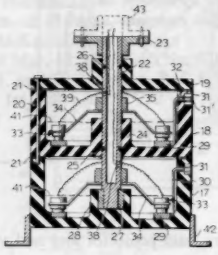
Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Mar. 29, 1976, Ser. No. 671,701

Int. Cl.² G01N *21/24;* H01R *39/02, 39/08*

U.S. Cl. 356—72 **4 Claims**

1. In a weather resistance and solar radiation tester having a specimen rotating frame rotatable on a shaft around a light source and having a light receiving element on the specimen rotating frame having leads extending through the shaft and a meter for indicating the amount of light received by said light receiving element, improved contact means for electrically connecting the leads to the meter, said contact means comprising a rotating shaft connected to said shaft for the specimen rotating frame, upper and lower cases surrounding said rotating shaft and in which said rotating shaft is rotatably journaled and defining two separate compartments spaced along said rotating shaft and sealed from each other, said cases being of electrically insulating material, a metal ring fixed in the bottom of each case and a lead extending from each ring out through the respective case for connection to the meter, a plate spring in each compartment fixed to said rotating shaft, at least one contact piece on said plate spring in each compartment and in sliding contact with said metal rim therein and held in contact by said plate spring, one of said leads extending through said rotating shaft into one compartment and being electrically connected to the contact piece therein and the other of said



leads extending through said rotating shaft and into the other compartment and being electrically connected to the contact piece therein, and an electrically insulating liquid in each compartment covering said rings and contact pieces therein, whereby deterioration of the resistance value of the contact means is avoided by elimination of the contamination due to contact wear.

4,049,352

METHOD AND APPARATUS FOR DETERMINING THE RATE OF FLOW OF PARTICLES IN A VACUUM DEPOSITION DEVICE

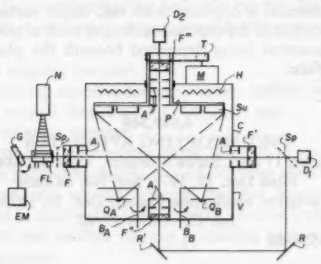
Marcel Lardon, Maienfeld, Switzerland, and Hans Pulker, Triesen, Liechtenstein, assignors to Balzers Patent und Beteiligungs AG, Liechtenstein

Filed Oct. 3, 1975, Ser. No. 619,528

Claims priority, application Switzerland, Oct. 9, 1974, 013668/74

Int. Cl.² G01N *21/00;* B05C *11/00*

U.S. Cl. 356—73 **5 Claims**



1. A method of determining the rate of flow of particles in a vacuum deposition device comprising the steps of establishing a current of particles in the device, directing a first laser beam through the current, measuring the attenuation of the first laser beam due to absorption by the particle current and therefrom determining the vapor density within the current, determining the first laser beam absorption wavelength by observing the beam after it has passed through the current, passing a second laser beam through the current in a direction different from the first laser beam direction and determining the second laser beam absorption wavelength after it has passed through the current, deriving the difference of absorption wavelengths of the two laser beams as an indication of the velocity of the current, and determining the rate of flow of the particles by

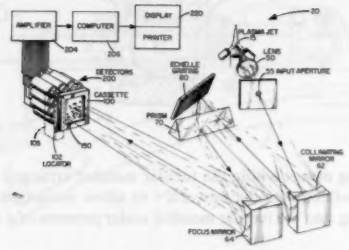
using the relationship that the rate of flow of the particles is equal to the said vapor density times the said velocity.

4,049,353

SPECTROMETRIC SYSTEM AND CASSETTE

Danilo V. Missio, Belmont, Mass., assignor to SpectraMetrics, Incorporated, Andover, Mass.

Filed Aug. 11, 1976, Ser. No. 713,436
Int. Cl.² G01J *3/38, 3/02*
U.S. Cl. 356—85 **17 Claims**



1. A cassette for use in a spectrometer system, the cassette adapted to receive spectral energy on its face surface and to transmit such energy therethrough and to a detector adjacent the back surface, which cassette comprises:

a. a face mask plate having at least one inlet opening therein to receive spectral energy, the face plate adapted to be placed in the focal plane of a spectrometer;

b. a back plate spaced apart from and generally parallel to the face plate and having at least one outlet opening therein to transmit spectral energy received by the inlet opening to a detector, the outlet opening being nonaligned with the inlet opening; and

c. optical transmitting means within the cassette which comprises,

i. a first reflecting mirror adjacent the inlet opening and positioned to receive spectral energy and to direct angularly the received energy, and

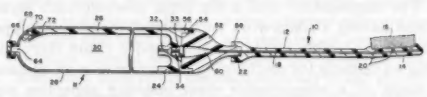
ii. a second reflecting mirror adjacent the outlet opening and positioned to receive the spectral energy from the first mirror and to transmit the received energy to the outlet opening, whereby spectral energy from a spectrometer focal plane is directed through nonaxially aligned inlet and outlet openings of a cassette to a detector.

4,049,354

TOOTHBRUSH WITH DENTIFRICE ATTACHMENT

James L. O'Rourke, 6351 Memorial, Detroit, Mich. 48228

Continuation-in-part of Ser. No. 506,009, Sept. 16, 1974, Pat. No. 3,936,200. This application Jan. 9, 1976, Ser. No. 646,501
Int. Cl.² B43K *5/14;* B43M *11/06*
U.S. Cl. 401—134 **2 Claims**



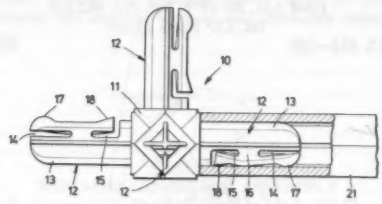
1. A toothbrush comprising a brushing unit, an elongated cartridge unit having a chamber adapted to contain a dentifrice, said cartridge unit having a head at one end and an elongated spine along one side of said chamber to facilitate gripping said cartridge unit, said chamber being defined at least in part by squeezable wall, said brushing unit including a shank portion having a head at one end provided with bristles, a coupler at the other end of said shank portion releasably connected to said one end of said cartridge unit, passage means from said chamber including passages through said one end of said cartridge unit, said coupler, said shank portion and said head to convey dentifrice to said bristles when forced from said chamber by the squeezing of said wall, and a check valve in said spine for said chamber adapted to close when said wall is squeezed and to open and admit air to said chamber when said wall is released after squeezing, said check valve being located in a wall of said cartridge unit and when open providing direct communication between the dentifrice in said chamber and the ambient air surrounding said cartridge unit through said spine.

4,049,355

PIPE COUPLING

Takashi Kawazu, No. 10-4, 5-chome, Nakano-cho, Miyakojima, Osaka, Japan

Filed Mar. 26, 1976, Ser. No. 671,001
Claims priority, application Japan, May 19, 1975, 50-61404
Int. Cl.² F16B *7/00*
U.S. Cl. 403—172 **2 Claims**



1. A pipe coupling comprising:

a. a base portion having faces equal in diameter to the pipe **(11)**;

b. a plurality of insertion legs with a free end rounded, each of said insertion legs **(12)** being integral with and extending outwards from the base portion;

c. equally spaced integral ridges **(13)** longitudinally extending on said legs so as to provide a friction fit in the inner perphery of a pipe to be connected, at least one of the ridges being given an elasticity by means of opposing slots **(14, 15)** longitudinally provided below the ridge and defined by a web portion **(16)** supporting the ridge on the leg, said slots giving elasticity to the end portions of the ridge;

d. a round outer projection **(17)** on said ridge adjacent the outwards end portion and an outer upward slant **(18)** extending towards the inner end of said ridge, the extremity of the slant defining a sharp point for preventing the removal of the insertion leg out of a pipe and wherein a belt insertion hole is provided in the base portion.

4,049,356

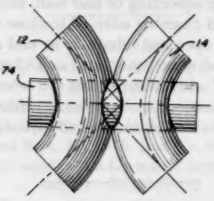
DOUBLE-SIGMOID CONNECTOR

Henry Howard George, Louisville, and Ronald Joseph Billings, Fern Creek, both of Ky., assignors to Chemetron Corporation, Chicago, Ill.

Filed Apr. 22, 1976, Ser. No. 679,098
Int. Cl.² F16B *1/00*
U.S. Cl. 403—173 **5 Claims**

1. In a double-sigmoid connector comprising a pair of arcuate elbows joined to each other at their outer peripheral midsections, an improvement wherein a pipe extends through an opening in the outer peripheral midsection of each elbow and is joined to each elbow so as to join said elbows to each other and wherein said pipe has alongitudinal central axis and each

elbow has opposite ends respectively defining central axes intersecting the axis of said pipe at a point and wherein the



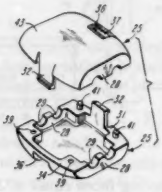
points where the axes defined by the ends of said elbows intersect the axis of said pipe are spaced from each other.

4,049,357

SLIDING COUPLING DEVICE FOR A LANYARD OR THE LIKE

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 30, 1976, Ser. No. 682,126
Int. Cl.² F16G *11/00*
U.S. Cl. 403—209 **9 Claims**



1. A coupling device for connecting a first flexible cord section of a lanyard or the like with a second flexible cord section, said device comprising a pair of housing sections disposed in opposing adjacent relation, said housing sections including means defining an internal cavity therebetween and having opposite corresponding end portions each defining a set of spaced openings extending to and connected by said cavity, said openings being constructed for receiving said cord sections and providing for relative sliding movement of at least one of said cord sections, each of said housing sections including a projecting integral hook-like clip portion disposed adjacent one side of said housing section, each of said housing sections including means defining a through aperture extending from said cavity adjacent the opposite side of said housing section for receiving said projecting clip portion of the other said housing section, and each said clip portion projecting from its corresponding said housing section across said cavity and into said aperture of the other said housing section and engaging said other housing section to fasten said housing sections together with said cord sections disposed therebetween within said openings.

4,049,358

VISIBLE MARKERS FOR ROAD SURFACES

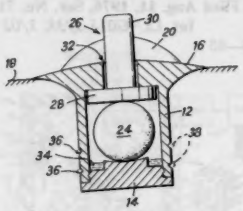
Mendel King, 46 Primley Park Ave., and Raymond Brannan, 42 Ramshead Drive, both of Leeds, England

Filed Feb. 23, 1976, Ser. No. 660,225
Claims priority, application United Kingdom, Sept. 4, 1975, 36535/75
Int. Cl.² E01F *9/00*
U.S. Cl. 404—11 **9 Claims**

1. A light-reflective road marker comprising:

1. an outer tubular member closed at its base and adapted in a roadway, the upper part having a flange extending outwardly to lie on the surface of the roadway,

2. at least one reflector held in a translucent plastic casing mounted for reciprocation in the upper part of the tubular member with its reflective surface against the inside of the casing in a plane of the long axis of the tubular member, and



3. spring means within the tubular member arranged to bias the reflector casing upwardly to allow retraction of the casing into the tubular member under pressure of a vehicle tire,

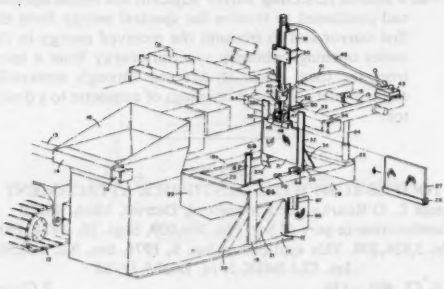
said spring means being a solid spherical ball made of silicone rubber, and said casing is a polycarbonate resin sealing said reflector hermetically therewith so that entry of moisture is prevented.

4,049,359

INSERTION OF COMPRESSIBLE SHEETS IN CONCRETE

Terry David Koch, Telford, Pa., assignor to Inno-Cept Corporation, Lansdale, Pa.

Filed Aug. 2, 1976, Ser. No. 710,714
Int. Cl.² E01C *19/52, 23/02*
U.S. Cl. 404—89 **10 Claims**



1. The combination with a slip form concrete curb laying machine having a framework and, carried thereby, a hopper for receiving freshly mixed concrete and a chute therefrom having an opening for discharging the concrete in an upstanding shape, of a compressible sheet inserting apparatus supported by said machine and comprising a holder for releasibly retaining a compressible sheet of fibrous material beyond and above the discharge opening and perpendicular to the chute length, power actuated means for moving said holder vertically downwardly to force a sheet through the deposited concrete and paddle plates disposed as lengthwise extensions of the opposite sides of the chute and below said holder to bear against the opposite sides of the concrete and overcome bulging of the concrete as the sheet is inserted.

4,049,360

VARIABLE STATOR VANE ACTUATING MECHANISM

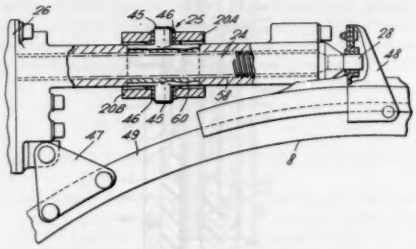
Leonard Stanley Snell, Bristol, England, assignor to Rolls-Royce (1971) Limited, England

Filed Apr. 19, 1976, Ser. No. 678,120

Claims priority, application United Kingdom, May 1, 1975, 18118/75

Int. Cl.[2] F03B *15/06*

U.S. Cl. 415—149 R 3 Claims



1. In a turbo-machine having a casing and a compressor with at least one row of stator vanes which are angularly adjustable, a mechanism comprising a beam connected at one end to the casing through a universal joint and a pivot offset therefrom, a beam driving member, means mounting said member for movement in a straight line tangent to an imaginary circle, which is coaxial with the compressor casing, an actuator for driving said beam driving member along said straight line, means pivotally connecting said beam to said beam driving member at a position remote from the end of the beam, which is connected to the casing through said universal joint and said pivot, said pivot being offset from said universal joint so as to enable the beam to move in the direction of its own longitudinal length relative to said casing by motion at the pivot and at the universal joint and to enable the beam simultaneously to move by motion at the universal joint when the beam driving member is driven along said straight line by the actuator, a ring, and means connecting the beam through universal joints to said ring, and means connecting said ring to the stator vanes whereby movement of the driving member causes variation of the angles of the stator vanes.

4,049,361

RUNNER SEALS FOR HYDRAULIC TURBINES

Selim A. Chacour, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

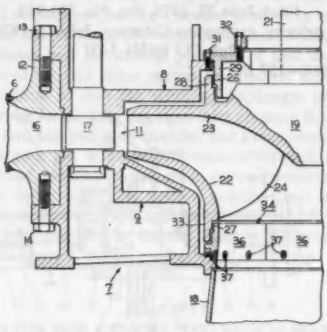
Continuation of Ser. No. 575,736, May 8, 1975, abandoned. This application Sept. 24, 1976, Ser. No. 726,450

Int. Cl.[2] F01D *11/00*; F16J *15/50*

U.S. Cl. 415—170 A 3 Claims

1. A water turbine comprising:

a vertically disposed runner composed of vertically spaced crown and band elements connected together by a plurality of runner vanes, said runner having a radially disposed intake and a vertically disposed discharge opening; an annular stationary discharge ring disposed adjacent to and beneath said band element and defining an opening therethrough coaxial with said runner discharge opening; a stationary head cover disposed adjacent to and above said crown element; a draft tube connected to said discharge ring and defining a water passageway coaxial with said discharge ring opening and vertically spaced from the end of said runner defining said discharge opening; an annular substantially axially directed first sealing surface formed on the radially inner facing surface of the lower end of said band element; a throat ring releaseably connected to the lower end of said discharge ring providing a radially inner facing surface mating with said draft tube and said runner discharge opening to form a surface continuation of said water passageway; and an annular substantially axially outer facing surface of said throat ring cooperating with said first sealing surface to form therebetween a restricted water passage, all radially outer facing surfaces



of said runner being spaced from any surface of said stationary structure a distance greater than the distance between the surfaces forming said restricted water passage.

4,049,362

WIND-DRIVEN ROTOR ASSEMBLY

Arthur E. Rineer, P.O. Box 115, Beulah, Mich. 49617

Filed June 21, 1976, Ser. No. 698,489

Int. Cl.[2] F03D *3/06*

U.S. Cl. 416—119 1 Claim

1. A wind-driven power generator having a normally vertical column mounted in a base structure for rotation about the axis of said column, and including a plurality of articulating airfoils each secured at the upper extremity thereof to a transverse plate fixed with respect to said column, said generator also including means operative to convert rotative torque from said column to usable power, wherein the improvement comprises:

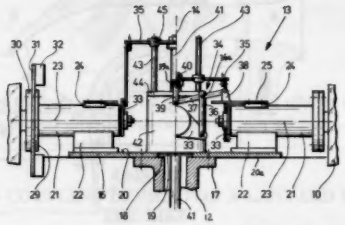
a triangular panel constituting each of said airfoils, one corner of said panel being pivotally connected to a lower portion of said column, the edge of said panel opposite from said corner being pivotally connected to said transverse plate, said panel edge being disposed at an annular relationship with respect to a line connecting said corner and edge pivotal connection such that said edge engages said plate on rotation of said panel with respect to said plate in one direction, and said edge extends to engage said column on rotation of said panel with respect to said plate in the opposite direction to establish a limited sector of freedom of movement of said panel.

4,049,363

AXIAL FLOW FAN WITH ADJUSTABLE BLADES

Jan Baumann, Essen-Bredeney, and Franz Petter, Herne, both of Germany, assignors to Gea Luftkuhlergesellschaft Happel GmbH & Co. KG, Bochum, Germany

Filed June 27, 1975, Ser. No. 591,062
Claims priority, application Germany, July 13, 1974, 2433727
Int. Cl.[2] B63H *3/02*
U.S. Cl. 416—157 B **40 Claims**



1. In an axil flow fan, a combination comprising a hub rotatable about a first axis and including a substantailly circular plate-like base having a substantially smooth and flat side normal to said axis; means for rotating said base; a plurality of hollow housings affixed to said base at said side thereof and each having a second axis normal to said first axis; a plurality of blades, one for each of said housings, each of said blades having a shank journalled in the respective housing and being turnable about the respective second axis; and means for turning said shanks, including an elongated pusher having an axis coinciding with said first axis and extending through said base, means for moving said pusher axially, displacing means affixed to said pusher at said side of and being rotatable with said base, a lever rigid with each of said shanks, and a discrete power train connecting each of said levers with said displacing means so that axial movements of said pusher in first and second directions respectively result in clockwise and counterclockwise angular displacements of said shanks, including a linkage disposed in a plane which is parallel to said first axis, and including a first double link articulately connected with the respective lever, a second double link articulately connected with said displacing means, and a second lever having a first arm articulately connected with the respective housing, a second arm articulately connected with said respective second double link and an intermediate portion articulately connected with the respective first double link.

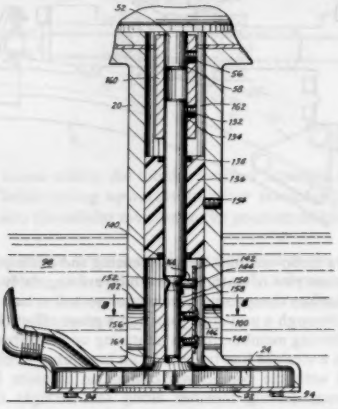
4,049,364

REMOVABLE IMPELLER ASSEMBLY FOR PRINTING PRESS CENTRIFUGAL PUMP

Joseph Ross, Brooklyn, and Ernest F. Fuchs, Middle Village, both of N.Y., assignors to Ace Envelope Manufacturing Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 484,429, July 1, 1974, Pat. No. 3,947,152. This application Feb. 13, 1976, Ser. No. 657,963
Int. Cl.[2] F04B *39/14*
U.S. Cl. 417—360 **8 Claims**

1. A centrifugal pump apparatus comprising
a motor assembly, and
an impeller assembly,
said motor assembly comprising
an extended motor shaft, and
motor shaft extending means
for extending the length of said motor shaft,
said extended motor shaft being rotationally coupled to said motor shaft and in coaxial alignment therewith,
said impeller assembly comprising
a housing having an upper portion and a lower portion, and
an impeller,
coupling means disposed within said upper housing portion for releasably securing said impeller to said extended motor shaft and for providing concomitant rotational movement of said impeller with said extended motor shaft,
said motor shaft and said extended motor shaft extending into said upper housing portion,
said coupling means including alignment means for longitudinally and laterally aligning said impeller within said lower housing portion and for positioning said extended motor shaft and said impeller in coaxial alignment,
ink barrier means for preventing the flow of ink along part of



the length of said extended motor shaft and along an adjacent void within said upper housing portion,
said coupling means comprising a flattened surface on said extended motor shaft,
said flattened surface being disposed in a plane parallel to the longitudinal axis of said extended motor shaft,
said impeller having a hub portion with an opening therein,
said flattened surface being engageable within said opening,
said opening having a mating flattened surface therein, and
said mating flattened surface being capable of engaging said flattened surface.

4,049,365

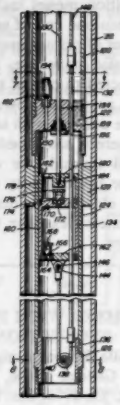
OIL WELL PUMP WITH PLUNGER PULL DOWN AND DESANDING ASSEMBLY

Virgil H. Sparks, Sr., Box 2084, Bakersfield, Calif. 93303

Filed Sept. 13, 1974, Ser. No. 505,929
Int. Cl.[2] F04B *21/04;* **F01B** *9/00*
U.S. Cl. 417—554 **6 Claims**

1. A pump adapted for use in an oil well for pumping heavy crude oil comprising a vertically disposed pump barrel having a lower end in communication with a production zone and an upper end communicating with storage facilities at ground level, a plunger reciprocally mounted in the pump barrel and including a pump rod string extending to ground level for actuation, said barrel and plunger including valve means for pumping fluid from a production zone to ground level, and pull down means connected to said plunger for exerting a downward force on the plunger and pump rod string connected thereto to facilitate downward movement thereof when pumping heavy crude oil, said pull down means including a tension member extending downwardly from the plunger, and means disposed externally of the barrel to exert a force on said tension member for pulling the plunger and pump rod string downwardly, said means disposed externally of the barrel including a weight attached to the plunger, said weight being disposed in a chamber below the barrel isolating it from the fluid being pumped, said chamber being closed with the weight closely fitting therein, said weight being connected to the

plunger by said tension member in the form of a polish rod, said chamber including light weight oil in the interior thereof and said weight including passages therein to enable vertical



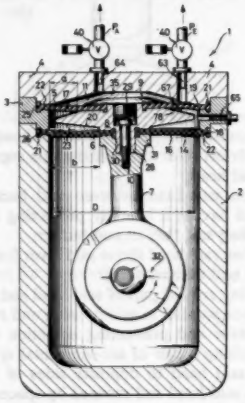
reciprocation of the weight in the chamber without restriction and a packing in the upper end of the chamber sealing said polish rod.

4,049,366

DIAPHRAGM PUMP

Erich Becker, Glocklehofweg 13, 7812 Bad Krozingen, Germany

Filed Jan. 20, 1976, Ser. No. 650,761
Claims priority, application Germany, Jan. 23, 1975, 2502566
Int. Cl.² F01B *19/00*; F16J *3/02*; F04B *45/04*; 417 *437;569;412;402*
U.S. Cl. 417—569 **13 Claims**



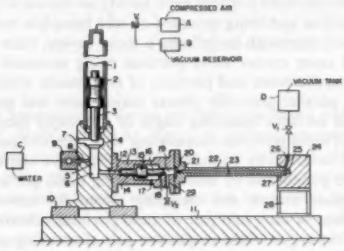
1. A diaphragm pump, especially a vacuum pump for gas, comprising pump housing means; a working diaphragm extending transversely through said pump housing means and defining at one side of said working diaphragm within said pump housing means a pumping chamber; fluid inlet and outlet means communicating with said pumping chamber; a safety diaphragm extending transversely through said pump housing means spaced from the opposite side of said working diaphragm and defining with the latter and part of said pump housing means a fluid-tightly enclosed space; drive means comprising a connecting rod having a substantially mushroom-shaped head positively connected to central portions of said diaphragms, said head extending between said diaphragms and being constructed to support a portion of said working diaphragm around said central portion of the latter and to contact said safety diaphragm over a smaller area than said working diaphragm while keeping said diaphragms separated through a small distance from each other, said head having an outer periphery closely adjacent to the inner periphery of said housing part and a volume to fill a major portion of said enclosed space, said diaphragms having a neutral position in which said diaphragms are substantially unstressed and located in two parallel planes and the central portions of said diaphragms being moved by said drive means to opposite sides of said neutral position so that the working diaphragm performs a suction stroke for sucking gas at an inlet pressure through said fluid inlet into said pumping chamber and a compression stroke for discharging gas at an outlet pressure through said fluid outlet, both of said diaphragms are in stressed condition during movement away from said neutral position; and means for maintaining in said enclosed space a pressure which is smaller than said inlet pressure to thereby dampen vibration of said working diaphragm during operation of said pump.

4,049,367

APPARATUS FOR GENERATING SHOCK WAVES BY MEANS OF A SUPERSONIC PROJECTILE

Hiroshi Tominaga, Yokohama; Kazuo Yasunami, Amagasaki; Shinroku Saito, Yokohama; Masanobu Takamatsu, Yokohama, and Akira Sawaoka, Yokohama, all of Japan, assignors to Tokyu Sharyo Seizo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1973, Ser. No. 404,043
Claims priority, application Japan, Oct. 6, 1972, 47-100511
Int. Cl.² B01J *3/06*
U.S. Cl. 425—77 **6 Claims**



1. An apparatus for generating shock waves, comprising a first vertical cylinder connectable selectively at its upper end to a source of compressed gas or to a vacuum source, a first hammer fitting slidably within said first cylinder, a first cylindrical plunger coaxial and integral with the lower end of said first hammer, a hydraulic pressure chamber communicating with said first cylinder and having an axial hole dimensioned and disposed to receive said first plunger slidably with minimum clearance, said hydraulic pressure chamber having a vent hole means above said axial hole for establishing a liquid level in said hydraulic pressure chamber when liquid is transferred in excess into said hole, a piston chamber having first and second coaxial cylindrical ends, said first cylindrical end being hydraulically connected with said pressure chamber, a piston fitting slidably within said first and second ends, said piston being continuously reciprocable within said piston chamber, said second cylindrical end and the end of said piston therein forming a gas chamber fillable with a gas of low molecular weight, said second end of said piston chamber having an exit vent, a diaphragm blocking said exit vent and being selected to burst at predetermined pressure on compression said low molecular weight gas by said piston, a barrel having an elongated bore therethrough connected removably at one end thereof to said piston chamber at said vent, said bore at said one end and said other end of said piston chamber being gastightly connected when said diaphragm is burst, said barrel being adapted for holding a projectile slidably in said bore at said one end

thereof, and a holder for holding a workpiece at the other end of said barrel, said holder being vented.

4,049,368

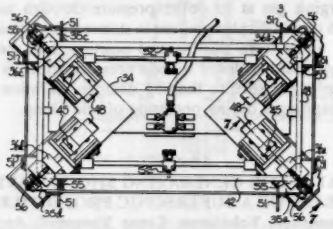
APPARATUS FOR MANUFACTURING FURNITURE

Erich Grachten, Detmold, Germany, assignor to Burris Industries, Inc., Lincolnton, N.C.

Division of Ser. No. 549,519, Feb. 13, 1975. This application Apr. 22, 1976, Ser. No. 679,099

Int. Cl.² B29C 27/00

U.S. Cl. 425—502 **5 Claims**



1. Apparatus for manufacturing furniture by joining panels and making corners, the apparatus comprising baseplate means for defining lower terminal ends of mold cavities, a plurality of outer corner mold portions each having an inwardly facing concave surface and being mounted on said baseplate means for cooperation therewith in defining a mold cavity, a plurality of inner corner mold portions each having an outwardly facing convex surface and being mounted on said baseplate means for cooperation therewith in defining a mold cavity, pairs of said outer and inner corner mold portions being mounted for receiving therebetween end portions of two panels which have generally parallel generally planar major faces and generally planar end surfaces bounding edges of the major faces, each said pair of mold portions cooperating with received panels for defining a mold cavity bounded by the respective end surfaces of the two panels and by said cooperating mold portions and said baseplate means, and clamping means for moving one mold portion of each said pair of mold portions relative to the other mold portion of the respective pair of securing panels in mold cavity defining relation therewith.

4,049,369

PHOTOFLASH LAMP AND MULTILAMP UNIT WITH ELECTROSTATIC PROTECTION

John W. Shaffer, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Montoursville, Pa.

Filed Dec. 29, 1975, Ser. No. 644,351

Int. Cl.² F21K 5/02

U.S. Cl. 431—95 R **12 Claims**

1. A photoflash lamp comprising

an hermetically sealed, light-transmitting envelope;

a quantity of metallic combustible material in filamentary form located within said envelope;

a combustion-supporting gas in said envelope;

and ignition means disposed in said envelope in operative relationship with respect to said filamentary combustible material, said ignition means including a pair of lead-in wires extending into one end of said envelope in a spaced relationship, a mass of primer material bridging said lead-in wires within said envelope, and a conductive wire electrically connected to one of said lead-in wires within said envelope and projecting toward the other end of said envelope to assure contact with said filamentary combustible material, whereby said combustible material is electrically connected to said one of the lead-in wires to thereby reduce the susceptibility of said lamp to inadvertent ignition from electrostatic discharges, said conductor wire having a diameter less than the diameter of the connected lead-in wire.

4,049,370

CIGARETTE LIGHTER WITH PRESALE TAMPER PROTECTION

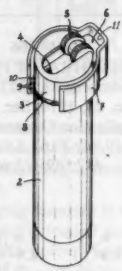
Guy Neyret, Francheville, France, assignor to Societe Anonyme dite: Etablissements Genoud & Cie, Venissieux, France

Filed Sept. 18, 1975, Ser. No. 614,649

Claims priority, application France, Sept. 24, 1974, 74.32782

Int. Cl.² F23Q 25/00

U.S. Cl. 431—144 **1 Claim**



1. A lighter comprising:

an elongated housing having a cylindrical head and formed with a cylindrical reservoir containing a supply of fuel;

a burner on said head;

valve means on said head between said burner and said reservoir and having a laterally projecting lever actuatable for feeding said fuel to said burner;

a striker wheel on said head above said lever for igniting fuel issuing from said burner; and

a shield extending around part of said head and formed with a channel open parallel to said housing and receiving said projecting lever and preventing actuation thereof, said shield comprising a pair of arc-segmental aprons extending around said head to opposite sides of said channel coaxial with said head and secured by spaced-apart webs to said housing, said webs being integral with said housing and said aprons, said shield having an inwardly directed lip immediately underlying said projecting lever.

4,049,371

PIPE INSULATION

Glen Virgil Pribie, Malvern, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 15, 1976, Ser. No. 666,547

Int. Cl.² F27B 9/14

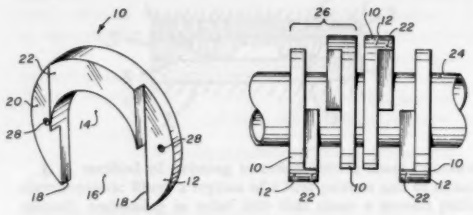
U.S. Cl. 432—234 **3 Claims**

1. Pipe insulation comprising a plurality of units, each unit comprising:

a. a generally circular piece of insulating material having a generally circular hole in the center thereof thereby form-

ing an annular disc and having a portion of the annulus of the disc omitted, said omitted portion having sides which are parallel to each other and which are tangent to the periphery of said hole and which extend outwardly to the periphery of said disc,

b. a piece of insulating material integral with and extending outwardly from one face of said disc in the area bonded by extensions of the parallel sides of said omitted portion and on the opposite side of said hole from said omitted portion,



c. the thickness of said disc and said outwardly extending piece on the face thereof being of equal thickness, and

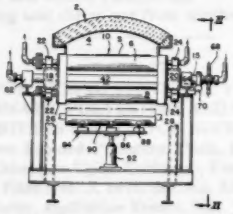
d. said plurality of units being positioned on a pipe in pairs such that each unit of each pair has said outwardly extending piece extending into said omitted portion of the other unit of said pair and including means for holding said units and pairs in position.

4,049,372

APPARATUS FOR SUPPORTING AND REMOVING A WORK SUPPORTING ROLL

William M. Bloom, Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed May 4, 1976, Ser. No. 683,103
Int. Cl.[2] F27D *3/00, 7/00;* F27B *9/28*
U.S. Cl. 432—246 **9 Claims**



1. Apparatus for supporting and removing a work supporting roll from a furnace comprising a rotatable shaft assembly, spaced apart bearings for supporting said rotatable shaft assembly about an axis parallel to that of the work supporting roll, a first pair of spaced apart bearings mounted on said shaft for rotatably supporting said work supporting roll, a second pair of spaced apart bearings mounted on said shaft diametrically opposed to said first pair for rotatably supporting a spare work supporting roll, a water cooled shield supported by said shaft assembly between said work supporting rolls, said water cooled shield having a water cooling chamber and insulation surrounding said cooling chamber and extending the length thereof, said shield having circular segmental side portions having a radius extending from the axis of said shaft assembly a distance substantially equal to that from the axis of said shaft assembly to the outermost part of said rolls, and means for rotating said shaft assembly.

4,049,373

APPARATUS FOR PRODUCING COMPACT POLYCRYSTALLINE INP AND GAP INGOTS

Klaus Zeuch, Eckental, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 11, 1976, Ser. No. 665,879
Claims priority, application Germany, Mar. 11, 1975, 2510587
Int. Cl.[2] F27B *14/10*
U.S. Cl. 432—265 **6 Claims**

1. An apparatus for use in producing compact polycrystalline InP, GaP and GaAs ingots of defined geometric form comprising an elongated reaction boat having a plurality of melting pots, each of the shape of a single crystal melting crucible in which said ingots are to be further processed, formed therein, said plurality of melting pots arranged in a line and, a canal between each two adjacent melting pots extending over essentially the full height thereof, whereby said melting pots can be filled with indium or gallium, the reaction boat disposed in zone melting apparatus, heated in a narrow zone in an atmosphere staurated with phosphorous or arsenic and the zone moved from one end to the other to form ingots in succession with free indium or gallium migrating to the other end and available for reuse.

4,049,374

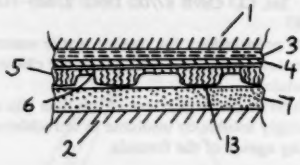
SIMULTANEOUS TRANSFER PRINTING AND EMBOSSING OR SURFACE TEXTURING METHOD

Thomas Rejto, 19 Homestead Road, Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 597,562, July 21, 1975. This application Jan. 17, 1977, Ser. No. 759,887

Int. Cl.[2] D06P *1/00;* B44C *1/24*

U.S. Cl. 8—2.5 A 5 Claims



1. A method of printing in color onto a sheet containing thermoplastic fibers a replica of a first pattern and of simultaneously embossing in relief into that sheet a second pattern without substantially affecting the first pattern as so printed, said method comprising the steps of

a. superposing

i. a heat transfer printing sheet bearing a vaporizable or sublimable dye according to a first pattern, the dye having a high affinity for the material of said sheet containg thermoplastic fibers and a strong volatility and penetrating strength,

ii. an embossing sheet the material of which is permeable to said dye and has no affinity or retention properties for said dye, said embossing sheet having in the face thereof remote from said printing sheet a design in relief according to said second pattern, and

iii. said sheet containing thermoplastic fibers,

b. applying heat and pressure to the superposed sheets to cause migration of said dye through the material of said embossing sheet and into said sheet containing thermoplastic fibers and to cause reproduction in the latter, in relief, of said second pattern, and

c. separating said sheets one from another.

4,049,375

PROCESS FOR DYEING SYNTHETIC FIBERS FORMED FROM AROMATIC POLYESTERS AND NEW MONOAZO DYESTUFFS USEFUL FOR SUCH DYEING

Jacques Pierre Edmond Pechmeze, Paris, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Nov. 7, 1975, Ser. No. 630,055

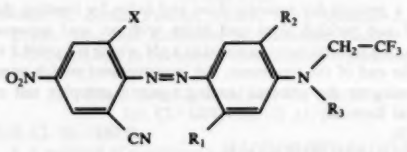
Claims priority, application France, Nov. 21, 1974, 74.38248

Int. Cl.[2] C09B *27/00, 29/08;* D06P *1/02*

U.S. Cl. 8—41 C 6 Claims

1. Process for dyeing synthetic fibers based on aromatic polyesters by means of a water-insoluble monoazo dyestuff whereby the dyed fibers are fast to light, said dyestuff having the formula:

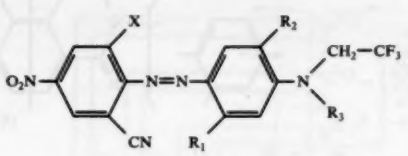
(I)



wherein X represents a radical selected from the group consisting of hydrogen, chlorine, bromine, cyano, nitro, and lower alkylsulphonyl, R_1 represents a radical selected from the group consisting of hydrogen, chlorine, bromine, lower alkyl, lower alkoxy and acylamino, R_2 represents a radical selected from the group consisting of hydrogen and lower alkoxy and R_3 represents a radical selected from the group consisting of lower alkyl, β-hydroxyethyl, β-cyanoethyl, β-acetoxyethyl and β-(β-acetoxyethoxy)ethyl.

3. Polyester fiber dyed with a dyestuff of the formula

(I)



wherein X represents a radical selected from the group consisting of hydrogen, chlorine, bromine, cyano, nitro, and lower alkylsulphonyl, R_1 represents a radical selected from the group consisting of hydrogen, chlorine, bromine, lower alkyl, lower alkoxy and acylamino, R_2 represents a radical selected from the group consisting of hydrogen and lower alkoxy and R_3 represents a radical selected from the group consisting of lower alkyl, β-hydroxyethyl, β-cyanoethyl, β-acetoxyethyl and β-(β-acetoxyethoxy)ethyl, wherein said dyed polyester fiber is fast to light.

4,049,376

DYED COPOLYESTERS AND METHOD OF MAKING

Alain Yves Le Pape, Rouen, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Oct. 6, 1976, Ser. No. 729,749

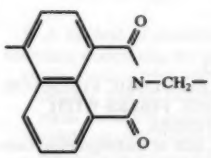
Claims priority, application France, Oct. 23, 1975, 75.32448

Int. Cl.[2] D06P *3/52;* D06L *67/02*

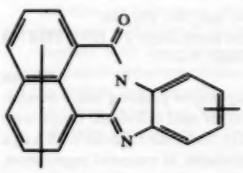
U.S. Cl. 8—162 R 4 Claims

1. A dyed copolyester wherein the macromolecular chain of the copolyester comprises a unit selected from those of the formulae:

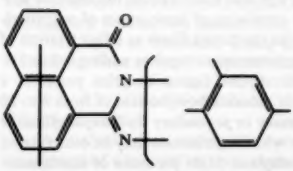
(II)



(III)



(IV)



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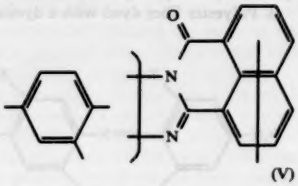
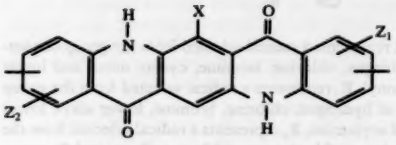
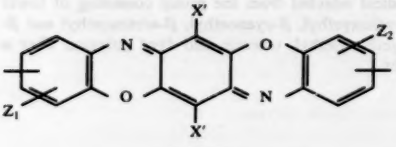


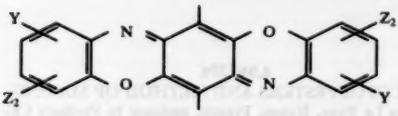
(V)



(VI)



(VII)



where X is hydrogen or hydroxy, X' is halogen, Y is alkoxy, Z_1 is hydrogen, halogen, alkyl or alkoxy and Z_2 is hydrogen or acylamino.

4,049,377

DYEING AND PRINTING OF CELLULOSIC FIBERS OR MIXTURES OF CELLULOSIC FIBERS WITH SYNTHETIC FIBERS

Hermann Schwab, and Adolf Blum, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed June 1, 1976, Ser. No. 691,496

Claims priority, application Germany, June 27, 1975, 2528743

Int. Cl.² D06P *1/613*

U.S. Cl. 8—169 **6 Claims**

1. An improved process for dyeing or printing water-swellable cellulose fibers and mixtures of said cellulosic fibers with synthetic fibers by contacting the fibers throughout with a dye liquor or a print paste which contains, as essential ingredients, water in an amount sufficient to swell the cellulosic fibers, a water-insoluble disperse dye and a solvent for the disperse dye selected from the group consisting of boric esters of polyalkylene oxides, and heating the contacted fibers to effect fixation of the dye wherein the improvement comprises adding 0.5 to 5% by weight, based on the dyeing liquor or print paste, of a condensate of an aliphatic monocarboxylic acid of from 8 to 20 carbon atoms and a primary or secondary hydroxyalkylamine of up to 6 carbon atoms, which condensate may be ethoxylated with up to 20 moles of ethylene oxide per mole of condensate.

4,049,378

DYESTUFF PREPARATIONS

Hermann Perrey, Krefeld; Jurgen Schulze, Opladen; Hans Jurgen Rosenkranz; Hans Rudolph, both of Krefeld, and Reinhold Hornle, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 18, 1975, Ser. No. 550,763

Claims priority, application Germany, Feb. 18, 1974, 2407743; Mar. 4, 1974, 2410185

Int. Cl.² C09B *67/00*; D06P *1/645*

U.S. Cl. 8—87 **3 Claims**

1. Dyestuff preparations for dyeing textile materials from organic water-immiscible solvents, which are characterised in that they contain

a. dyestuffs having a particle size of less than 10μ and which are sparingly soluble or insoluble in tetrachloroethylene;

b. dispersing agents of the formula

$$R^7[—NHCO—(O—CHR^8—CH_2)_z—R^9]_m$$

wherein

R^7 denotes an alkyl or aryl radical which contains one or two isocyanuric acid radicals and is optionally substituted by methyl groups, such as remains after removing *m* isocyanate groups from a corresponding *m*-functional isocyanate,

m is the number 3 or 4,

R^8 denotes hydrogen or methyl,

z represents the numbers 0–30 and

R^9 denotes O-alkyl or O-CO-alkyl, in each case with 8–20 C atoms in the alkyl radical, or O-phenylalkyl with 6–15 C atoms in the alkyl radical,

with the proviso that *z* represents 1–30 if R^9 denotes O—CO—alkyl or O-phenylalkyl; and

c. an organic solvent comprising phthalic acid C_1-C_8-dialkyl ester.

4,049,379

COMPLEX BASIC ZIRCONIUM SALTS AND ALUMINUM SALTS

Hans Erdmann, Heidelberg, and Franz-Friedrich Miller, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 579,885, May 22, 1975. This application July 19, 1976, Ser. No. 706,765

Claims priority, application Germany, May 30, 1974, 2425970

Int. Cl.² C14C *3/02*

U.S. Cl. 8—94.26 **10 Claims**

1. In a process for tanning skins and hides by treating the delimed and pickled skins and hides with an acid aqueous solution of a mineral tanning agent at a pH which is from 4.2 to 4.6 at the end of the treatment, the improvement which comprises using as the mineral tanning agent a complex salt of empirical formula

$$[(ZrO)_a(Al)_b(OH)_c(R)_d(X)_f]\ H_e,$$

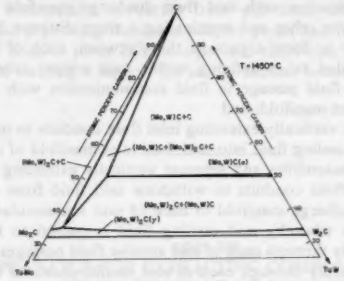
in which R is a monocarboxylic acid radical of 1 to 4 carbon atoms, X is chloride or half of sulfate, *a* and *b* are independently of each other from 1 to 9, *c* is from 0 to $((4a+3b)-0.333(a+b))$ and *d* is from 0.333 $(a+b)$ to $((4a+3b)-0.333(a+b))$, provided $c+d$ is from 0.333 $(a+b)$ to $(4a+3b)$, *f* is $(4a+3b)-(c+d)$ and *e* is 2*a*.

4,049,380

CEMENTED CARBIDES CONTAINING HEXAGONAL MOLYBDENUM

Stephen Wei Hong Yih; Samuel Austin Worcester, Jr., both of Albany, and Erwin Rudy, Beaverton, all of Oreg., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed May 29, 1975, Ser. No. 581,787
Int. Cl.[2] C22C 29/00
U.S. Cl. 428—539.5 2 Claims



1. A composition of material comprising sintered carbide-binder metal alloys in which the carbide comprises a hexagonal monocarbide phase which is a solid solution of tungsten monocarbide and molybdenum monocarbide of stoichiometric composition containing between 10 and 100 mole percent molybdenum monocarbide, and in which the binder is selected from the metals of the iron group and from the additional group consisting of molybdenum, tungsten, chromium, copper, silver and aluminum, with the iron group consisting between 3 and 50 weight percent of the composition and the additional group comprising between 0 and 10 weight percent of the composition.

2. A composition of material comprising sintered carbide-binder metal alloys, in which the carbide comprises a hexagonal monocarbide phase which is a solid solution of tungsten monocarbide and molybdenum monocarbide of stoichiometric composition containing between 10 and 100 mole percent molybdenum carbide and a cubic carbide phase selected from the group consisting of titanium carbide, tantalum carbide, vanadium carbide, niobium carbide and hafnium carbide, with the cubic carbide comprising up to 85 weight percent of the total carbide phase, and in which the binder is selected from the iron group and from the additional group consisting of molybdenum, tungsten, chromium, copper, silver and aluminum, with the iron group comprising between 3 and 50 weight percent of the composition and the additional group comprising between 0 and 10 weight percent of the composition.

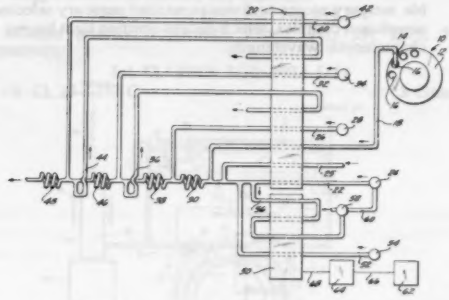
4,049,381

APPARATUS AND METHOD OF FLUID SAMPLE ANALYSIS

Donald A. Burns, Putnam Valley, N.Y.; Michael J. Brand, Bryan, Tex., and Alexander M. Saunders, Bedford Village, N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Mar. 23, 1976, Ser. No. 669,785
Int. Cl.[2] G01N 31/00, 33/16
U.S. Cl. 23—230 R 10 Claims

1. A method of preparing a concentration gradient, comprising the steps of: flowing a first liquid from a source in a stream along a first conduit to fill said conduit; continuing said flow of said first liquid along said first conduit subsequent to said filling step; and removing a portion of said first liquid from said stream through a second conduit coupled to said first conduit and at a controlled varying rate and concurrently adding a second liquid to said stream through a third conduit coupled to said first conduit and at a controlled varying rate, the junction of said third and first conduits being downstream from the junction of said second and first conduits, said rates of removal



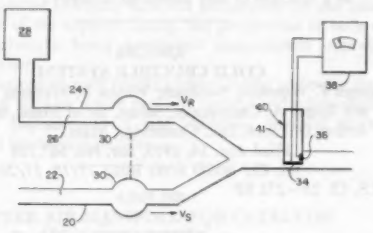
from and addition to said stream in said first conduit being the same.

4,049,382

TOTAL RESIDUAL CHLORINE

James W. Ross, Jr., Hull, and Albert A. Diggens, Newton, both of Mass., assignors to Orion Research Incorporated, Cambridge, Mass.

Filed Feb. 16, 1977, Ser. No. 768,953
Int. Cl.[2] G01N 33/18, 27/52
U.S. Cl. 23—230 R 9 Claims



1. A method of monitoring the total residual chlorine in solutions, comprising the steps of:

continuously mixing with a sample stream of the solution, a reagent stream comprising a disassociated complex of alkali metal ion and iodide ion, and an excess amount of iodide ion, said iodide ion completely reacting with all the residual chlorine to form iodine; and

continuously measuring in the resulting mixed stream of solution and reagent, the electric potential developed between a first and second electrode, each placed in contact with the mixture, the first having a noble metal oxidation-reduction element reflecting the ratio of iodine to iodide concentration, the second having an iodide sensitive membrane reflecting the iodide concentration whereby the concentration of iodine is determined.

4,049,383

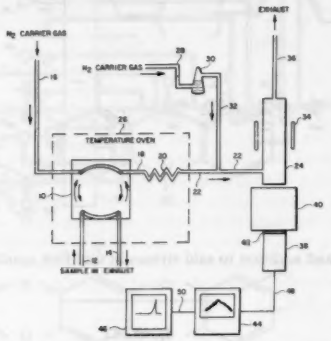
METHOD OF DETECTING GASEOUS CONTAMINANTS

C. Shepherd Burton, San Rafael; Alan B. Harker, and William W. Ho, both of Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 6, 1977, Ser. No. 757,277
Int. Cl.[2] G01N 21/58, 21/26
U.S. Cl. 23—232 E 10 Claims

1. A method of measuring the concentration of a selected constituent of a gaseous mixture containing said constituent in amounts of less than about 10 ppm comprising the steps of:

a. separating a sample of the gaseous mixture into its various constituent parts;
b. sequentially introducing the constituent parts into a reaction zone and reacting said constituent parts with metastable mercury atoms to form an excited mercury-selected constituent complex, which decays emitting light having a characteristic wavelength;



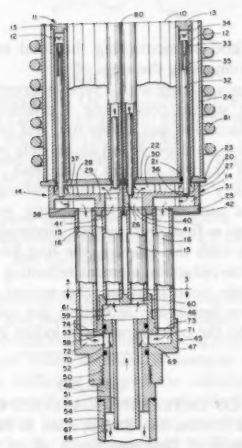
c. providing a light intensity measuring means for selective measurement of the light intensity of the characteristic wavelength emitted by decay of the mercury-selected constituent complex;
d. measuring the intensity of the emission resulting from the decay of said excited mercury-selected constituent complex; and
e. determining the concentration of the selected constituent as a function of said measured intensity.

4,049,384

COLD CRUCIBLE SYSTEM

Joseph F. Wenckus, Needham; Wilson P. Menashi, Lexington, and Roger A. Castonguay, Salem, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Apr. 14, 1975, Ser. No. 567,714
Int. Cl.[2] B01D *9/00;* **B01J** *17/18, 17/20*
U.S. Cl. 23—273 SP **15 Claims**



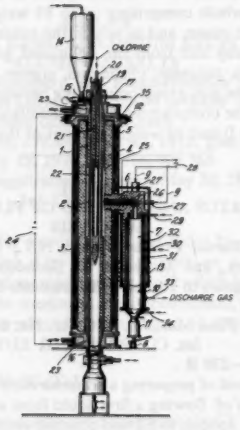
1. A cold crucible, comprising in combination
a. two complementary semicircular assemblies each comprising a plurality of contacting linear copper tubes arranged to form a semiannular wall, each of said tubes having a fluidtight cap at one end thereof, said linear copper tubes in each of said assemblies being affixed to a semicircular compartmentalized fluid distribution means, each said distribution means having upper and lower walls defining therebetween a separate fluid inlet manifold and a separate fluid discharge manifold; said semiannular assemblies when maintained in close but spaced relationship defining a cylindrical configured container for which said upper wall of said fluid distribution means forms the bottom;
b. in each of said copper tubes a concentric open-ended, smaller-diameter copper tube having one end in fluid communication with said fluid discharge manifold and having the other end terminating a short distance from said cap to form a passage therebetween, each of said open-ended tubes defining within said copper tube an annular fluid passage in fluid communication with said fluid inlet manifold; and
c. separate vertically extending inlet fluid conduits to introduce a cooling fluid into said fluid inlet manifold of each of said assemblies and separate vertically extending discharge fluid conduits to withdraw said fluid from said fluid discharge manifold of each of said semiannular assemblies whereby said cooling fluid is caused to flow upwardly through each of said annular fluid passages and downwardly through each of said smaller-diameter copper tubes to provide essentially uniform cooling around said crucible, said separate means to introduce and to withdraw said fluid for one of said assemblies being separate and distinct from the other of said assemblies, whereby said cylindrically configured container can not provide a dead short to an rf field maintained around said crucible.

4,049,385

APPARATUS FOR CARRYING OUT CHLORINATING REACTIONS

Josef Bohnenstingl; Manfred Laser, both of Julich; Günter Lossmann, and Helmut Gebhard, both of Bonn, all of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung

Continuation of Ser. No. 428,327, Dec. 26, 1973, abandoned.
This application Dec. 29, 1975, Ser. No. 644,888
Claims priority, application Germany, Dec. 22, 1972, 2262881
Int. Cl.[2] B01J *8/08;* **H05B** *3/62*
U.S. Cl. 23—277 R **4 Claims**



1. An apparatus for carrying out chlorinating reactions which includes in combination: a shaft furnace comprising a vertical graphite tube having a resistance heating zone, a supply for material to be chlorinated connected to the upper part of the shaft furnact to feed material to said tube, means for

feeding chlorine, a graphite shell surrounding said tube, condenser means communicating with said furnace and having an integral tubular adapter piece connecting said condenser means to said furnace, said condenser means and adapter piece being made of graphite with said adapter piece being fixed to said graphite shell at one end and extending outwardly from said furnace to its integral connection to said condenser means on the other end, a withdrawal outlet for the reaction product, a gas tight steel casing surrounding said shell and said condenser means and said adapter piece, said adapter piece extending horizontally outwardly from said shell, said condenser means depending from said adapter piece, and means to heat said adapter piece and incorporated therewith, said adapter piece forming a support for said condenser means.

4,049,386

APPARATUS FOR EXTRACTING COMPONENTS OF SOLIDS BY MEANS OF A LIQUID

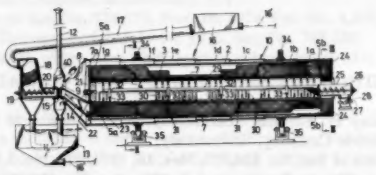
Arthur Jules Gillain, Brussels, Belgium, assignor to Ateliers Belges Reunis, Petit-Enghien, Belgium

Filed Oct. 22, 1975, Ser. No. 624,911

Claims priority, application Netherlands, Oct. 23, 1974, 7413897

Int. Cl.² B01D *11/02, 33/06*

U.S. Cl. 23—269 **12 Claims**



1. Apparatus for extracting components of solids, by means of a liquid contacting the solids in counter-current flow, comprising:

a rotating drum which comprises an outer casing, impervious to the liquids, having the shape of a body of revolution, an inner casing substantially impervious to the liquid, concentrically arranged inside the outer casing, having also the shape of a body of revolution, and defining a central axial channel, the axial length of the drum being much greater than the diameter of the outer casing, a plurality of radial walls, angularly spaced from one another, pervious to the liquid, extending axially along said drum, substantially between the inner casing and the outer casing, said radial walls and said inner and outer casings substantially defining generally axial compartments for the solids, said compartments extending substantially from one end to the other of the drum and having, along a cross section at right angle to the drum axis, the general shape of a truncated circle sector the apex of which merges with the drum axis;

solids supply means for supplying a portion of solids to said compartments at one end of said drum;

removal means for removing another portion of solids from said drum at the other end of said drum;

liquid supply means for supplying liquid into the part of said compartments situated underneath the longitudinal axis of said drum, at said other end thereof; and

overflow means for allowing the liquid to overflow out of said drum at said first end of said drum.

4,049,387

EXHAUST GAS PURIFIER

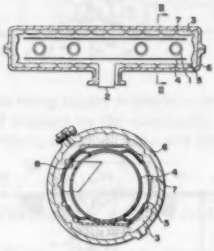
Kazumasa Futamura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 12, 1976, Ser. No. 676,191

Claims priority, application Japan, July 29, 1975, 50-104996[U]

Int. Cl.² F01N *3/10;* **B01J** *1/14*

U.S. Cl. 23—277 C **3 Claims**



1. An exhaust gas purifier comprising:

an outer shell surrounding an inner shell defining a reburning chamber,

a support casing surrounding and spaced from said outer shell,

a heat insulating material in the space between said outer shell and support casing,

a network of elongated outwardly directed projections formed on the outer surface of the outer shell, a network of elongated inwardly directed projections on the inner surface of the support casing, the projections of both of said networks being positioned diametrically opposite each other,

the projections on each of said support casing and outer shell forming pockets which partially receive and substantially inhibit displacement of said insulating material during normal use of said purifier.

4,049,388

CENTER AIR MANIFOLD FOR CATALYTIC CONVERTER

George Edward Scheitlin, and Richard Frederick Little, both of Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.

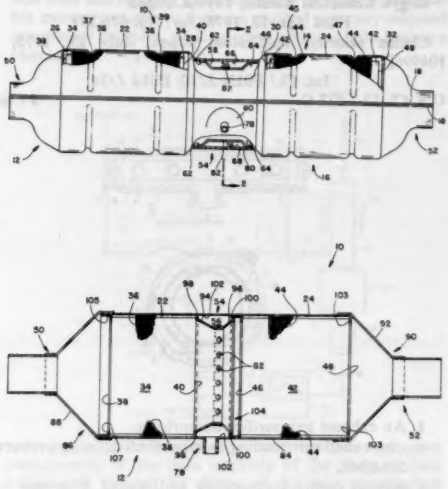
Filed July 12, 1976, Ser. No. 704,240

Int. Cl.² B01J *8/00;* **F01N** *3/15*

U.S. Cl. 23—288 FB **5 Claims**

1. In a catalytic converter for combustion product comprising a shell defining first and second longitudinally spaced apart shell portions, said shell having an interior wall, a first substrate containing a reducing catalyst, the first substrate dispoed in the first shell portion, a second substrate containing an oxidizing catalyst, the second substrate disposed in the second shell portion, said shell further having an inlet for introducing combustion product into the first shell portion and an outlet for exhausting combustion product from the second shell portion, and a third passageway providing communication between the first and second shell portions, means for introducing air into the combustion product flowing longitudinally through the third passageway and means for providing access to the air introducing means through the shell, the inprovement wherein the air introducing means comprises at least one channel section, the at least one channel section being formed to extend perimetrally substantially completely about the interior wall of the shell generally transversely to combustion product flow through the third passageway, the at least one channel section including upstream and downstream edge portions for engaging the interior wall of the shell and an intermediate portion extending between the upstream and downstream edge por-

tions for defining between the channel section and the shell interior wall a manifold, said manifold including a plurality of



apertures opening inwardly for directing a plurality of streams containing air from the manifold into the combustion product.

4,049,389

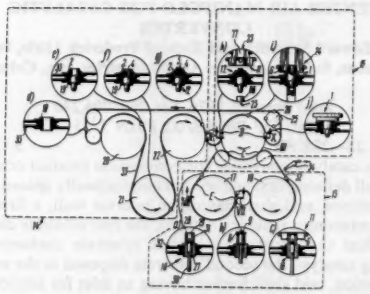
METHOD AND APPARATUS FOR ASSEMBLING AEROSOL VALVE

Ijun Iosifovich Grinberg, ulitsa Zavodskaya, 4a, kv. 42; Evgeny Kuzmich Zhukov, ulitsa Fevralskaya, 1, kv. 14, both of Klimovsk Moskovskoi oblasti, and Lev Nikolaevich Koshkin, 3 Samotechny pereulok, 23, kv. 54, Moscow, all of U.S.S.R.

Filed Apr. 13, 1976, Ser. No. 676,655

Int. Cl.² B23P *23/00*

U.S. Cl. 29—157.1 R **10 Claims**



1. A method for assembling an aerosol valve made up of a number of components comprising a valve body with a central hollow wherein are disposed a spring and a stem, a sealing disk formed from a resilient material which has a central bore and is disposed on said stem and said valve body, a valve cap with a central aperture and a cavity, the diameter of said aperture exceeding that of the bore of said sealing disk and said cavity accommodating said sealing disk and a top portion of said valve body; said valve cap is rigidly attached to said valve body by deforming the valve cap; said method including the following steps:

forming from said components a first vertical "sealing disk-valve cap" set in a sequence defined by:

aligning said sealing disk by means of its bore;

constraining the ability of said sealing disk to move downwards,

placing said valve cap on said sealing disk; and

forming from said components a second vertical "valve body-spring-stem" set in a sequence defined by:

disposing said valve body vertically, hollow upwards,

fitting said spring into the hollow of said valve body,

placing said stem on said spring accommodated in the hollow of said valve body;

assembling said first and second vertical sets into said aerosol valve by

relieving the sealing disk of said first set from said aligning,

gripping said first set by means of the bore of said sealing disk from the top through the aperture in said valve cap and transferring said first set while retaining its original orientation into a position coaxially with said second set by placing said first set above said second set,

bringing said first and second sets one towards the other so as to place all said components into the specified position relatively to each other in said valve, and

attaching said valve body to said valve cap by deforming said valve cap, assuring thereby the assembling of all said components into an integral structure of the valve.

4,049,390

METHOD FOR EXTRUSION OF COAL CONTAINING BODY

Anthony H. Furman, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 524,577, Nov. 18, 1974, Pat. No. 3,989,433.

This application Aug. 2, 1976, Ser. No. 710,925

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.² C10L *5/00, 5/22*

U.S. Cl. 44—10 R **3 Claims**

1. In a method for the extrusion of a cohesive continuous, rod-like coal-containing body wherein a mixture containing powdered coal and a binder is fed into an extruder barrel structure adjacent one end thereof, said mixture is moved through said barrel structure by the rotation of an extruder screw disposed therein and is forced at the outer end thereof through die means, said die means having the internal configuration of the wall thereof in the shape of a right circular cylinder whereby said mixture is consolidated into the desired continuous, rod-like cohesive body and after discharge from said die means, said continuous body is subdivided, the improvement comprising the steps of:

a. providing for uninterrupted containment of said mixture during consolidation thereof to form the rod-like body in said die means and

b. simultaneously applying at least four controllably varied forces at a common station along said die means the magnitude of which forces is automatically controlled, each of said forces being applied into the die volume against the outer surface of said rod-like body via a separate discontinuity in said wall shortly before discharge thereof from said die means, said simultaneous force applications occurring subsequent to said uninterrupted containment along an axial length substantially shorter than the axial length of said uninterrupted containment.

4,049,391

PROCESS FOR REFUSE DISPOSAL AND HEAT RECOVERY THEREFROM

Paul G. Marsh, Hamilton, Ohio, assignor to Black Clawson Fibreclaim, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 456,041, April 1, 1974, which is a division of Ser. No. 203,295, Nov. 30, 1971, Pat. No. 3,830,636, which is a continuation-in-part of Ser. No. 94,084, Dec. 1, 1970, Pat. No. 3,736,223, which is a continuation-in-part of Ser. No. 14,431, Feb. 26, 1970, abandoned, and a continuation-in-part of Ser. No. 99,554, Dec. 18, 1970, Pat. No. 3,714,038. This application May 13, 1976, Ser. No. 685,784

The portion of the term of this patent subsequent to Jan. 30, 1990, has been disclaimed.

Int. Cl.[2] C10L *5/00*

U.S. Cl. 44—10 R 10 Claims

1. A process for producing lump fuel from refuse which comprises,

a. adding water to refuse to form a pulpable mixture,

b. pulping said mixture to disintegrate the refuse,

c. extracting from the pulped refuse a slurry containing combustible particles having predetermined dimensions,

d. separating non-combustible particles from said extracted slurry,

e. concentrating said slurry by removal of water therefrom to form a concentrate of said combustible particles, and

f. forming said concentrate into lumps.

4,049,392

METHOD FOR EXTRUSION OF COAL CONTAINING BODY

Anthony H. Furman, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 524,576, Nov. 18, 1974, Pat. No. 4,025,262. This application July 26, 1976, Ser. No. 708,536

The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.

Int. Cl.[2] C10L *5/00, 5/22*

U.S. Cl. 44—10 R 4 Claims

1. In a method for the extrusion of a cohesive, continuous, rod-like coal-containing body wherein a mixture containing powdered coal and a binder is fed into an extruder barrel structure adjacent one end thereof, said mixture is moved through said barrel structure by the rotation of an extruder screw disposed therein and is forced at the outer end thereof through die means of substantially constant cylindrical configuration internally whereby said mixture is consolidated into the desired continuous, rod-like cohesive body and thereafter said continuous body is subdivided after discharge from said die means, the improvement comprising the steps of:

a. controllably infinitely varying within a preselected range the extent of internal surface area of said die means available for contact with the consolidating mixture passing through said die means during continuous extrusion therethrough of the consolidating mixture and

b. continuously discharging therefrom a substantially constant diameter rod-like body by maintaining the internal configuration of said die means cylindrical.

4,049,393

COLORED PETROLEUM-DERIVED PRODUCT

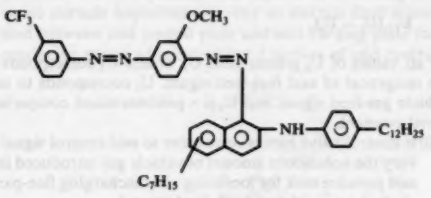
Richard B. Orelup, Upper Saddle River, N.J., assignor to Morton-Norwich Products, Inc., Chicago, Ill.

Division of Ser. No. 524,528, Nov. 18, 1974, which is a division of Ser. No. 313,591, Dec. 8, 1972, Pat. No. 3,862,120. This application Sept. 2, 1975, Ser. No. 609,397

Int. Cl.[2] C10L *1/10*

U.S. Cl. 44—59 2 Claims

1. A colored petroleum-derived product selected from the group consisting of gasoline, diesel oils, motive oils, heating or fuel oils, lubricating oils, kerosene, jet fuels and naphthas having dissolved therein a disazo colorant corresponding to the formula



said disazo colorant being highly resistant to removal from said petroleum-derived product by the commonly used adsorbents including carbon black, charcoal, clay and silica.

4,049,394

CONTROL SYSTEM FOR A COAL GASIFICATION PLANT

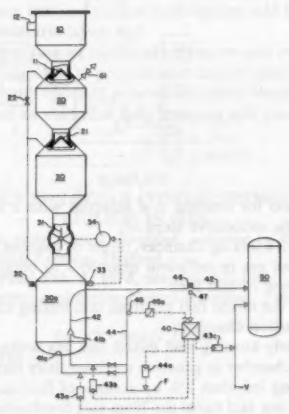
Paul Gernhardt, Bochum; Wolfgang Grams, Wanne-Eickel; Wilhelm Danguillier, and Siegfried Pohl, both of Bochum, all of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Dec. 1, 1976, Ser. No. 746,244

Claims priority, application Germany, Dec. 4, 1975, 2554565

Int. Cl.[2] B01J *3/00;* C10J *3/50*

U.S. Cl. 48—62 R 12 Claims



1. In an apparatus including a reactor to gasify fine-particle fuels under pressure, a main pressure tank having a level controller to maintain a desired fine-particle fuel level therein while such fuel and a partial quantity of vehicle gas are delivered therefrom by a fuel-feed conduit for introduction into said reactor, a vehicle-feed conduit coupled to said fuel-feed conduit for introducing the major portion of vehicle gas to convey said fine-particle fuel into said reactor, and conduit means to feed a gasification agent into said reactor, the combination therewith of a control system to maintain a predetermined volumetric ratio between said fine-particle fuel and said gasification agent during feeding into said reactor, said control system comprising:

first measuring means responsive to absorption of electromagnetic radiation by said fine-particle fuel in said fuel-feed line for producing a fuel-feed signal corresponding to the volumetric amount of fuel conducted by said fuel-feed line per unit of time,

second measuring means responsive to the volumetric amount of vehicle gas conducted by said vehicle-feed conduit to produce a vehicle gas-feed signal,

computing means responsive to said fuel-feed signal and said vehicle gas-feed signal to produce a control signal according to the following expression

$$U_1 \cdot (U_2 - U_s)$$

for all values of U_2 greater than U_s, where U_1 corresponds to the reciprocal of said fuel-feed signal, U_2 corresponds to said vehicle gas-feed signal, and U_s is a predetermined comparison signal constant,

first control valve means responsive to said control signal to vary the volumetric amount of vehicle gas introduced into said pressure tank for loosening and discharging fine-particle fuel into said fuel-feed conduit, and

second control valve means responsive to said control signal to vary the volumetric amount of gasification agent fed by said conduit means into said reactor.

4,049,395

METHOD FOR TREATING RAW MATERIAL WITH A TREATING GAS

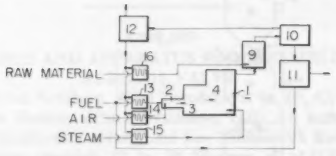
Shozo Ito, Ichikawa, Japan, assignor to Mifuji Iron Works Co., Ltd., Japan

Division of Ser. No. 546,737, Feb. 3, 1975, and a continuation-in-part of Ser. No. 823,746, May 12, 1969, abandoned. This application Sept. 18, 1975, Ser. No. 614,617

Claims priority, application Japan, May 15, 1968, 43-32170; June 20, 1968, 43-42258

Int. Cl.² C10J *3/00*; C01B *2/14*

U.S. Cl. 48—197 R **12 Claims**



1. A method for treating raw material with a treating gas comprising the successive steps of:

a. mixing, in a mixing chamber, liquid or gaseous fuel and air or oxygen gas in sufficient quantities to obtain complete combustion of said fuel;

b. ejecting the mixed fuel gas from said mixing chamber into a combustion chamber;

c. completely burning said mixed fuel gas within said combustion chamber to generate a substantially inert burnt gas containing less than 2% by volume of free oxygen gas;

d. introducing said burnt gas from said combustion chamber directly into a conditioning chamber having an inner volume of at least 1½ times that of said combustion chamber without passing said burnt gas through any flow restriction;

e. introducing at least one additional gas selected from the group consisting of steam, reducing gas, oxidizing gas or inert gas at a specified flow rate into said conditioning chamber simultaneously with the introducing of burnt gas thereinto and uniformly mixing the additional gas with said burnt gas to prepare a uniform treating gas having a desired uniform temperature determined solely by the temperatures of said additional and burnt gases without employing any other heating medium and a desired uniform composition;

f. introducing said treating gas from said conditioning chamber into a treating chamber separated from said conditioning chamber; and

g. treating a raw material selected from the group consisting of hydrocarbonaceous materials, carbonous materials, metal ores or metal oxides with said treating gas in said treating chamber to obtain a treated raw material product of uniform quality.

4,049,396

MOLDED ABRASIVE ARTICLE COMPRISING NON-FOAMED, FRIABLE POLYURETHANE AND PROCESS

Maurice Arthur Frederick Hiles, Welwyn, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 356,232, May 30, 1973, abandoned. This application Aug. 26, 1975, Ser. No. 607,809

Int. Cl.² C09K *3/14*

U.S. Cl. 51—295 **29 Claims**

1. A molded abrasive-containing article comprising a dispersion of abrasive particles in an unfoamed polyurethane substrate containing a multivalent metal borate, said substrate becoming friable at a temperature below its softening point.

4,049,397

PROCESS FOR THE PREPARATION OF GRANULATED ABRASIVES FROM FUSED OR SINTERED REFRACTORY INORGANIC HARD SUBSTANCES HAVING A HIGH GRAIN TOUGHNESS

Gerd-Edzard Bockstiegel, Troisdorf; Manfred Neidhardt, Siegburg; Gerhard Rehfeld, Aachen, and Werner Umlauf, Niederkassel, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Apr. 16, 1975, Ser. No. 568,642

Claims priority, application Germany, Apr. 27, 1974, 2420551

Int. Cl.² C09K *3/14*

U.S. Cl. 51—309 A **10 Claims**

1. A process for preparing an abrasive composition which consists essentially of crushing an alumina block or lump having an alumina content of 40–100% by weight and a zirconium content of 0–60% by weight to obtain a crushed mass; subjecting said mass to a grain shaping treatment by blasting the crushed material in an apparatus having at least one baffle plate; ball milling the crushed mass employing a grinding medium of balls whose diameter is between 3 and 8 cm. while revolving the ball mill at a rate of between 8 and 40 rpm, the weight of the milling medium being between 1.0 and 4.0 that of the weight of the crushed mass while carrying out the ball milling for a period of between 0.5 and 4.0 hours and thereafter separating particles from the so ball milled composition which have a particle size of 8-24 mesh from the balance of the material.

4,049,398

SEPARATING OXYGEN FROM THE AIR BY MEANS OF DISSOLVING AIR IN A NONMAGNETIC, INERT LIQUID AND THEN PARAMAGNETICALLY COLLECTING THE OXYGEN FROM THE LIQUID

Vesper A. Vaseen, 9840 W. 35th Ave., Wheatridge, Colo. 80033

Filed May 28, 1976, Ser. No. 691,037

Int. Cl.² B03C *1/00*

U.S. Cl. 55—3 **1 Claim**

1. An improvement in the Art and Science of recovering or concentrating oxygen from air by first absorbing or dissolving air in either fluorocarbon or silicone liquid, under pressure in order to increase the quantity of dissolved oxygen per unit of volume, then passing the oxygen saturated fluorocarbon or silicone liquid through or between the North and South Poles of a high intensity magnetic field; which by the paramagnetic qualities of oxygen causes the oxygen to collect at the magnetic poles of the electromagnet and form bubbles of pure oxygen which releases for collection and use.

4,049,399

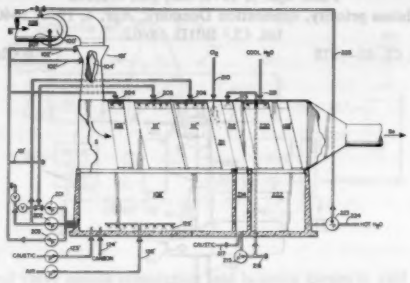
TREATMENT OF FLUE GASES

Aaron Joseph Teller, Westboro, Mass., assignor to Teller Environmental Systems, Inc., Worcester, Mass.

Continuation-in-part of Ser. No. 564,771, April 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 463,652, April 25, 1974, Pat. No. 3,957,464. This application Jan. 26, 1976, Ser. No. 652,634

Int. Cl.[2] B01D *53/06, 53/34*

U.S. Cl. 55—73 **37 Claims**



1. A process for treating an effluent gas containing entrained particulates a portion of which are below 1 micron in size, acid gas components, and a compound selected from the group consisting of H_2S, lower alkyl mercaptans, lower alkyl sulfides and lower alkyl disulfides, said gas having a temperature above 150° F., which comprises:

a. initiating nucleation of the particulates in a first enclosure by treating the gas to increase its turbulence and to increase its humidity substantially to saturation at a temperature above about 150° F. to about 212° F. under substantially adiabatic conditions, the pressure drop of said gas in said first enclosure being less than about 20 inches of water;

b. passing said saturated gas which is at a temperature above about 150° F. to about 212° F. in a substantially horizontal path through a second enclosure containing packing;

c. passing a scrubbing liquor comprising an aqueous alkaline slurry of activated, oxygenated carbon downwardly over said packing under laminar flow conditions;

d. exhausting said gas from said second enclosure; and,

e. collecting at least a portion of said liquid after passage through said packing and recirculating said liquid portion to said packing, said recirculating liquid portion containing at least about 15% non-volatile material by weight.

4,049,400

AIR PURIFYING APPARATUS

R. Jackson Bennett, 807 Garber Road, North Muskegon, Mich. 49445, and Daniel F. Connors, 25 E. Broadway, Muskegon Heights, Mich. 49441

Filed Apr. 7, 1976, Ser. No. 674,368

Int. Cl.[2] B03C *3/08*

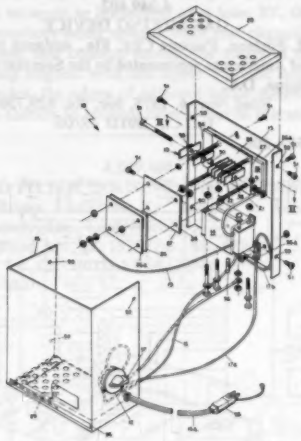
U.S. Cl. 55—139 **13 Claims**

1. An air purifying apparatus comprising:

a conductive central plate having a substantially planar side and edge surfaces and a planar end surface, said end surface being substantially perpendicular to both said side and edge surfaces for carrying an electrical charge of a first polarity capable of attracting airborne particle impurities;

a substantially planar dielectric layer having a first surface butting against and contacting said planar end surface and generally perpendicular to said side and edge surfaces of said central plate;

a substantially planar conductive backing plate oriented in a plane parallel to said dielectric layer, perpendicular to said side and edge surfaces of said central plate, and butting against and engaging a second side of said dielectric layer, which second dielectric layer side is opposite to the side contacted by said central plate, said backing plate carrying an electric charge of a second polarity which is opposite from said first polarity and capable of attracting airborne particle impurities whereby an electric field is created between said central plate and said backing plate for producing ozone adjacent said end surface of said central plate where that end surface butts against said first surface of said dielectric layer; and



means for applying an electrical voltage to said central plate and backing plate to provide said central plate and backing plate with opposite polarity electrical charges, respectively, and an electrical field between said plates.

4,049,401

APPARATUS FOR SEPARATING SUSPENSIONS OF LIQUIDS IN GAS

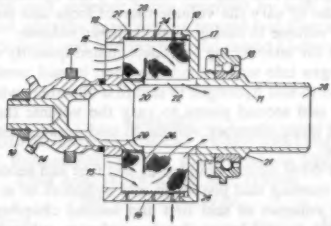
Stanley Smith, near Bristol, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Feb. 4, 1976, Ser. No. 655,098

Claims priority, application United Kingdom, Feb. 10, 1975, 5518/75

Int. Cl.[2] B01D *19/00*

U.S. Cl. 55—184 **8 Claims**



1. Apparatus capable of separating a suspension of a liquid in a gas comprising

a rotatable chamber having a packing within the chamber comprising a relatively rigid matrix adapted to avoid collapse under centrifugal forces on rotation of the chamber and having interstices defining plural flow passages pervious to the liquid and gas and which provide for both axial and radial movement of the suspension therethrough,

an inlet at one end of the chamber for admitting said suspension to the chamber,

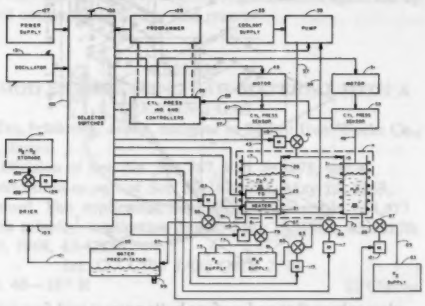
an outlet for liquid in a radially outer part of the chamber,
an outlet for gas in a radially inner part of the chamber at the other end thereof, and
means for promoting axial movement of the suspension through the chamber.

4,049,402

GAS MIXING DEVICE

Charles B. Fortson, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 6, 1975, Ser. No. 629,730
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—208 **4 Claims**



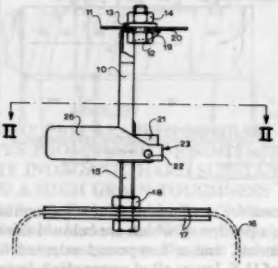
1. Apparatus for preparing a breathable mixture of hydrogen and oxygen gases in a predetermined ratio for use in deepsea diving, said apparatus comprising:
a first cylinder defining a first chamber holding a predetermined first volume of water;
a second cylinder defining a second chamber holding a second predetermined volume of water;
a first piston operable in said first cylinder for varying the volume of said first chamber between a chamber volume greater than said first volume of water and a lesser chamber volume equal to said first volume of water;
a second piston operable in said second cylinder for varying the volume of said second chamber between a chamber volume greater than said second volume of water and a lesser chamber volume equal to said second volume of water;
means for introducing a predetermined quantity of gaseous hydrogen into said first chamber while operating said first piston to vary the volume thereof from said lesser chamber volume to said greater chamber volume;
means for introducing a predetermined quantity of gaseous oxygen into said second chamber, in said predetermined ratio to said hydrogen in said first chamber, while operating said second piston to vary the volume thereof from said lesser chamber volume to said greater chamber volume;
piston drive means, coupled to said first and second pistons, for moving said pistons in said cylinders so as to reduce the volumes of said first and second chambers, respectively, to said lesser chamber volumes, whereby said hydrogen and said oxygen form first and second solutions with said first and second volumes of water, respectively;
refrigeration means, associated with said first and second cylinders, for cooling said water as said solutions are formed;
mixing means, connected to said first and second cylinders, for mixing said first and second solutions to form a third solution containing both said hydrogen and said oxygen in said predetermined ratio;
heating means, associated with one of said cylinders, for heating said third solution; and
precipitator means, connected to said mixing means and said one of said cylinders, for separating said breathable mixture from said third solution.

4,049,403

DEVICE FOR SUSPENSION OF AIR FILTER BAGS

Poul Werner Udengaard, Hellerup; Orla Mosevang; Finn Erling Thomsen, both of Hjallerup, and Erik Paul Eklund, Kongerslev, all of Denmark, assignors to H. Moldow A/S, Bagsvaerd, Denmark

Filed Apr. 2, 1976, Ser. No. 673,048
Claims priority, application Denmark, Apr. 4, 1975, 1440/75
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—378 **6 Claims**



1. A device for suspending a filter bag in an air filtration plant, comprising:
an elongated screw for attachment to the bag end,
a socket receiving said screw and having means adapted to be attached to and dependent from a supporting member,
a segment pivotally carried by said socket and having a plurality of teeth engageable with the threads of said screw, said segment being received through an opening in said socket, and
means carried by said socket for yieldingly biasing said segment for movement of its teeth through the opening into engagement with said screw thread enabling axial movement of said screw in one direction with said segment yielding against the bias of said biasing means to the passage of said screw in said one direction and preventing movement of said screw relative to said socket in the opposite axial direction, said engagement between said screw and said teeth lying on one side of a line normal to the axis of said screw and passing through both said pivot and the axis of said screw when said segment both enables and prevents movement of said screw relative to said socket in the opposite axial directions respectively.

4,049,404

VENTILATION SYSTEM WITH THERMAL ENERGY RECOVERY

Arthur C. W. Johnson, Troy, Mich., assignor to Combustion Research Corporation, Pontiac, Mich.

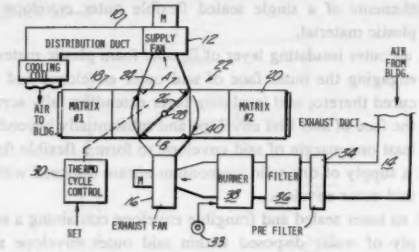
Filed July 31, 1975, Ser. No. 600,620
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—387 **8 Claims**

1. A forced air, non-recirculating ventilation system for an enclosure in which a thermal energy gradient relative to outside ambient air temperature has been produced by the expenditure of energy, said system comprising:
first means defining a distribution duct from an outside air source to said enclosure;
first air-flow-forcing means operatively associated with said first duct for producing a substantially continuous, unidirectional flow of substantially exclusively outside air to said enclosure;
second means defining an exhaust duct from said enclosure to the outside air source;

second air-flow-forcing means operatively associated with said second duct for producing a substantially continuous, unidirectional flow of inside air from said enclosure substantially completely to the outside;

first and second matrices of thermal energy absorbing material, each being characterized by a high surface area to volume ratio and low hydraulic resistance;

housing means for said matrices and arranged for air flow therethrough, to and from outside air;



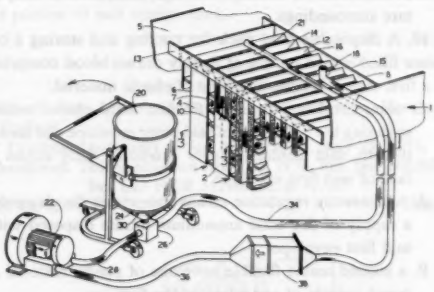
and valve means connecting said housing means to said first and second duct means for alternately reversely hydraulically connecting the duct means to respective matrices thereby to draw outside air into said enclosure to ventilate same through one matrix while complementally exhausting inside air from said enclosure through the other matrix.

4,049,405

FILTER MATERIAL CHARGING APPARATUS FOR FILTER ASSEMBLY FOR RADIOACTIVE CONTAMINANTS

Jesse M. Goldsmith, and Alex O'Nan, Jr., both of Louisville, Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Sept. 26, 1975, Ser. No. 617,248
Int. Cl.[2] B01D *46/32*
U.S. Cl. 55—479 **8 Claims**



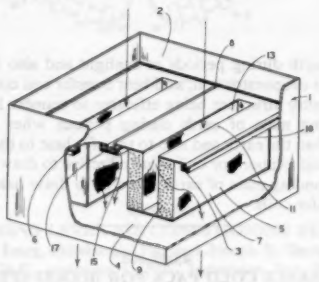
1. In combination a filter assembly for removal of radioactive contaminants in a gas stream including a housing having a fluid inlet and outlet and at least one filter bed being provided with adsorptive filter material therein in fluid communication with the fluid inlet and outlet, said at least one filter bed having spaced vertically extending foraminous sides and impervious ends for receiving adsorptive material therein, the upper portion of the spaced sides and ends defining an inlet for receiving said adsorptive material therein, an adsorptive charging apparatus for adding said adsorptive material to said housing comprising: a tank having a downwardly projecting lower portion terminating in an opening, said tank opening being in fluid communication with opposed first and second conduit means, said first conduit means being in flow communication with said inlet for receiving said adsorptive material therein, and said second conduit means coupling in fluid flow communication with a blower means to the tank opening, said first conduit means being spaced above said at least one filter bed a preselected distance, said first conduit means having one aperture therein disposed above said at least one filter bed, said at least one filter bed having baffle members along the top thereof, said baffle members being of inverted V-shaped cross section and positioned at an angle to horizontal of at least 30°, the apex of said baffle members being spaced from and aligned with the aperture in said first conduit means, the edges of said baffle members being aligned with the upper extreme edge of said foraminous sides, the edges of adjacent baffle members defining openings therein to receive filter material therethrough.

4,049,406

FLUID FILTER HOUSING AND ASSEMBLY

Richard D. Rivers, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Apr. 23, 1976, Ser. No. 679,516
Int. Cl.[2] B01D *53/04, 27/00, 35/00*
U.S. Cl. 55—484 **8 Claims**



1. A fluid filter housing and assembly comprising: a housing having a flow-through inlet and a flow-through outlet therein;

said housing having a channel of U-shaped cross section with an open top extending along the inner periphery of said flow-through inlet, and including fluid filtering material therein; and,

a replaceable filter assembly disposed within said housing in flow-through communication with said inlet and said outlet, said filter assembly having a continuous downwardly extending member along the outer periphery thereof, said member being received by said U-shaped channel whereby gases passing around said filter assembly pass through said filtering material in said U-shaped channel.

4,049,407

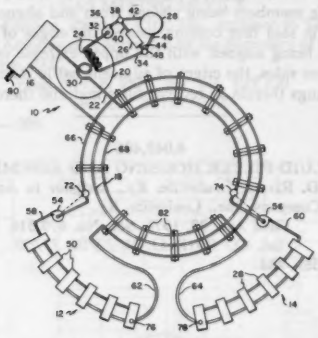
SOLAR ASSISTED HEAT PUMP SYSTEM

Edward W. Bottum, 9357 Spencer Road, Brighton, Mich. 48116

Filed Aug. 18, 1976, Ser. No. 715,306
Int. Cl.[2] F25B *27/00*
U.S. Cl. 62—2 **11 Claims**

1. A heating system for a building structure comprising a heat pump system picking up heat primarily from the outside air and at least one solar energy system and one air convector energy system, said heat pump system including a compressor, evaporator coil, condenser and necessary auxiliary components connected together in operative relationship, said evaporator coil being buried in the ground exteriorally of the building structure to be heated, said condenser having an outlet for connection to the building structure for transfer of heat energy thereof, said solar energy system including a solar collector structure, heat transfer coil and means for circulating a heat transfer medium therebetween, all connected together in oper-

ative relationship, said air convector energy system including an air convector structure, heat transfer coil and means for circulating a heat transfer medium therebetween, said heat transfer coils being buried in the ground exteriorally of the building structure to be heated and adjacent to the evaporator coil, said heat transfer coil connected to the solar collector structure being effective to transfer heat to the surrounding



mass of earth during periods of sunlight and also to transfer heat to the evaporator coil, said heat transfer coil connected to the convector structure being effective to transfer heat to the surrounding mass of earth during periods when the air is warmer than the earth and also to transfer heat to the evaporator coil, said evaporator coil being effective to draw heat from the surrounding mass of earth and also to draw heat from the heat transfer coils.

4,049,408

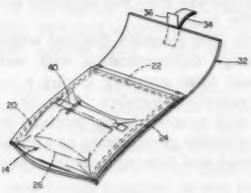
DISPOSABLE COLD PACK FOR BLOOD SPECIMEN

Harish A. Patel, Crystal Lake, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 556,721, March 10, 1975, abandoned. This application July 6, 1976, Ser. No. 703,104

Int. Cl.[2] F25D *5/02*

U.S. Cl. 62—4 **11 Claims**



1. A disposable cold pack for cooling and storing a container filled with a sample of freshly drawn blood comprising

a temperature regulation means which comprises the elements of a first sealed flexible envelope of plastic material,

a supply of dry solid ammonium nitrate disposed within said first envelope,

a second sealed and frangible envelope containing a supply of water disposed within said first envelope and arranged to be broken by pressure applied externally to said first envelope to release said supply of water into said supply of ammonium nitrate within said first sealed envelope to activate said cold pack,

the weight ratio of ammonium nitrate to water being from 1.24:1 to 1.26:1, the total weight of ammonium nitrate and water being from 180 to 200 grams, the elements of said temperature regulating means cooperatively functioning, upon the breaking of said second envelope, to cool said sample to a temperature low enough to avoid composition changes therein, but high enough to avoid freezing thereof, for a period of at least 45 minutes.

said cold pack being adapted to be folded around said sample container with the container in contact with said first envelope.

9. A disposable cold pack for cooling and storing a container filled with a sample of freshly drawn blood comprising

A. a temperature regulation means which comprises the elements of a single sealed flexible outer envelope of plastic material,

B. an outer insulating layer of flexible foam plastic material engaging the outer face of said outer envelopes and secured thereto, said insulating layer extending fully across the face of said first envelope and substantially beyond at least one margin of said envelope to form a flexible flap,

C. a supply of dry solid ammonium nitrate disposed within said outer envelope,

D. an inner sealed and frangible envelope containing a supply of water disposed within said outer envelope and arranged to be broken by pressure applied externally to said outer envelope to release said supply of water into said supply of ammonium nitrate within said outer sealed envelope to activate said cold pack,

the weight ratio of ammonium nitrate to water being from 1.24:1 to 1.26:1 and the total weight of ammonium nitrate and water being from 180 to 200 grams,

a closure member secured to said insulation layer flap at the margin thereof remote from said outer envelope for releasably maintaining said cold pack in folded position with said insulation layer outermost extending completely around the outer circumference of said folded cold pack,

said cold pack being adapted to be folded around said sample container with the container in contact with said outer envelope for the elements of said temperature regulation means cooperatively functioning to chill said blood sample rapidly and to maintain it at a temperature of 28° to 40° F. for at least 45 minutes after activation in room temperature surroundings.

10. A disposable cold pack for cooling and storing a container filled with a sample of freshly drawn blood comprising

a first sealed flexible envelope of plastic material,

an outer insulating layer of flexible foam plastic material engaging the outer face of said outer envelope and secured thereto, said insulating layer extending fully across the face of said first envelope,

A. temperature regulation means comprising the elements of a supply of dry solid ammonium nitrate disposed within said first envelope,

B. a second sealed flexible envelope of plastic material disposed outside of and adjacent the first,

C. a supply of water disposed within said second envelope,

the weight ratio of ammonium nitrate to water being from 1.24:1 to 1.26:1 and the total weight of ammonium nitrate and water being from 180 to 200 grams,

D. means connecting said first and second envelopes to permit mixing of the contents of the two envelopes, said elements of said temperature regulation means cooperatively functioning, upon said mixing, to chill said sample to a temperature low enough to avoid composition changes therein, but high enough to avoid freezing thereof, for a period of at least 45 minutes, and

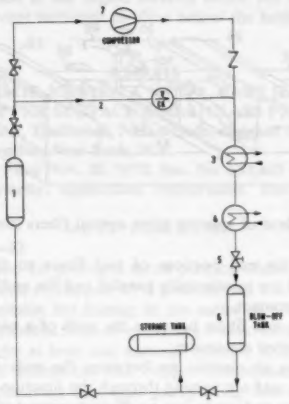
means for releasably sealing said connecting means to maintain the contents of the two envelopes separate.

4,049,409

METHOD FOR TRANSFERRING A HIGHLY COMPRESSED GAS FROM A REACTOR TO A STORAGE TANK WITH CONDENSATION OF THE GAS

Rudolf Rothe, Bremen, and Johann Kohler, Barrien, both of Germany, assignors to HAG Aktiengesellschaft, Bremen, Germany

Filed Mar. 8, 1976, Ser. No. 664,886
Claims priority, application Germany, Mar. 25, 1975, 2513169
Int. Cl.[2] F25T *1/00*; F17C *7/02*
U.S. Cl. 62—9 4 Claims



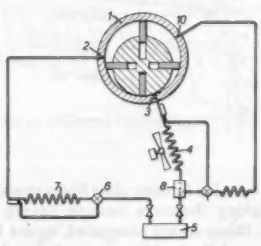
1. A method for transferring a highly compressed gas from a reactor into a storage tank with condensation of the gas which comprises at first liquefying and cooling the gas to a temperature below the storage temperature; expanding the liquefied gas in a blow-off tank; transferring the expanded liquefied gas into the storage tank; and after the pressure in the reactor has dropped to about the pressure in the storage tank exhausting any gas remainder portion in the reactor with a compressor and subjecting same to liquefying and cooling with subsequent expansion of said remainder portion in said blow-off tank; and transferring said expanded liquefied gas remainder portion to said storage tank.

4,049,410

GAS COMPRESSORS

Allan Sinclair Miller, Redbrook, Lower Dinedor, Hereford, England

Continuation-in-part of Ser. No. 492,930, July 29, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 668,853
Int. Cl.[2] F25B *31/00*; B25B *41/00*
U.S. Cl. 62—197 3 Claims



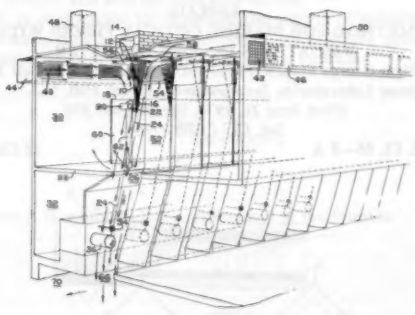
1. A refrigeration system including a positive displacement single stage rotary compressor with means providing a plurality of suction and compression chambers; means for injecting a single fluid only, that being the refrigerant gas in a liquid state, into an intermediate position on the compression side; a gas feedback circuit from the output of the compression side to said intermediate position, said circuit including means for liquifying gas from said output, means for positively ensuring that the supply of liquid is provided substantially only when the compressor is in operation and ceases when the compressor stops, a temperature sensor between said output and the liquifying means, and a valve responsive to said sensor between the liquifying means and said intermediate position, the sensor having a closed chamber containing fluid that is substantially directly influenced by the superheated gas from said output whereby it exerts a pressure directly related to the superheat temperature on a control member of said valve, and the valve having adjustment means whereby the valve can be set to maintain a desired degree of superheat of gas discharged from said output; a motor for driving the compressor, directly coupled thereto; means including a pump driven by and directly coupled to the motor for distributing a liquid coolant over said motor; and a heat exchanger in contact with the motor coolant through which gas in a liquid state is passed before being injected into said compressor, thereby to cool the coolant.

4,049,411

FORMING LEVEL AIR CONDITIONING SYSTEM

David M. Long, Pittsburgh, Pa., and Joseph B. Dent, Jr., Lexington, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 23, 1976, Ser. No. 707,985
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—2 15 Claims



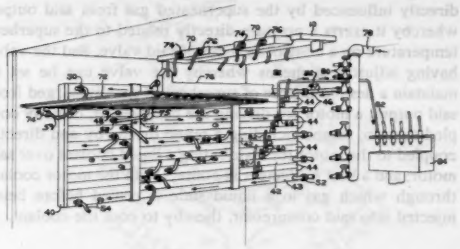
6. In a method of forming glass fibers comprising attenuating glass streams into fibers through a bushing and collecting the resulting fibers, the improvement comprising directing conditioned air to said bushing from opposing sides of said bushing at a level with said bushing and perpendicular to said bushing, to thereby direct substantially all of said conditioned air in a horizontal direction, said air being directed in sufficient amount and at sufficient velocity to produce a net positive air pressure in an area containing said bushing while providing flow of conditioned air to said bushing at the tips of bushing on opposing sides thereof at velocities of between about 50 and 150 feet per minute (15.24 and 45.72 meters per minute), and venting the air to a zone having a lower pressure.

4,049,412

METHOD AND APPARATUS FOR FORMING GLASS FIBERS

Joseph B. Dent, Jr.; Walter L. Martin, Jr., and Howard M. Bennett, all of Lexington, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 23, 1976, Ser. No. 707,986
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—2 **10 Claims**



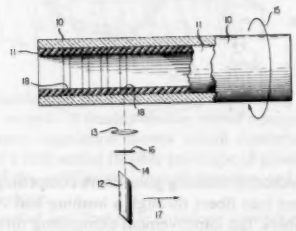
1. In a method of forming glass fibers comprising attentuating filaments through bushing tips in a bushing containing molten glass, the improvement comprising cooling both the environment surrounding and below the bushing and elements disposed in the fiber forming region adjacent the bushing by passing a cooling fluid through a pair of cooling manifolds, said manifolds being located on side partitions separating adjacent bushings, said manifolds being below the bushing on said partitions, said manifolds having inlet sections and outlet sections for flowing fluid in opposite directions, connecting said manifolds to said elements in fluid transfer relation, passing said fluid from the manifolds through said elements in a first direction to thereby cool said elements, returning said fluid from said elements to said manifolds, and flowing said fluid through said manifolds in the opposite direction to thereby cool said environment.

4,049,413

METHOD FOR MAKING OPTICAL FIBERS WITH VARIATIONS IN CORE DIAMETER

William George French, Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 21, 1976, Ser. No. 697,931
Int. Cl.[2] C03B *37/00*
U.S. Cl. 65—3 A **12 Claims**



1. A method for producing clad optical fibers with diameter variations in the transmitting core, but with uniform overall diameter, comprising:

etching grooves around a cylindrical glass starting member, which grooves are approximately perpendicular to the axis of the starting member and with a periodicity between 0.5/R mm and 50/R mm;

depositing additional glass on the etched starting member to form a glass member of uniform overall diameter; and

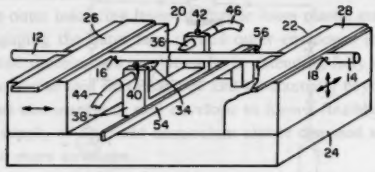
drawing the structure so formed into a fiber.

4,049,414

METHOD AND APPARATUS FOR SPLICING OPTICAL FIBERS

Roy E. Smith, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 28, 1975, Ser. No. 599,853
Int. Cl.[2] C03B *37/00*; C03C *27/00*
U.S. Cl. 65—4 B **12 Claims**



2. A method of splicing glass optical fibers comprising the steps of

aligning the end portions of said fibers so that the axes thereof are substantially parallel and the endfaces thereof are in contact,

disposing said fibers between the ends of a pair of spaced, rod-shaped electrodes,

generating an electric arc between the ends of said electrodes, said arc passing through the junction of said fiber endfaces and producing a sufficient amount of heat to melt the endfaces of said fibers, thereby causing said fibers to fuse, and

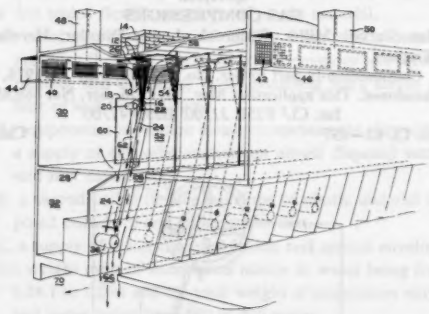
moving said electrodes in a direction perpendicular to the axes of said fibers so that the central portion of said arc moves along said fiber junction.

4,049,415

APPARATUS FOR FORMING GLASS FIBERS

Joseph B. Dent, Jr., Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 23, 1976, Ser. No. 707,967
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—11 W **1 Claim**



1. In an apparatus for forming glass fibers strands comprising a first level having therein a bushing having bushing tips through which filaments are attenuated, means for providing an air stream across the bushing, means for applying a binder and/or size to the filaments, means for gathering the filaments into a unified strand and a back shield member behind said means for applying the binder and/or size and said means for gathering the filaments, a second level having therein a means for collecting said strand and a floor separating said first level

and said second level, said floor having an opening provided therein through which a majority of said air stream is aspirated downwardly with said filaments and said strand through said opening, the improvement wherein said back shield includes an opening therein extending upwardly from said floor, said opening being of a sufficient height to vent the portion of said air stream which strikes the floor of said first level and thus does not pass through said opening downwardly with said strand and to allow said portion of said air stream to be aspirated back into said air stream to thereby prevent return of said portion of said air stream to the region directly below the bushing and thereby prevent turbulent air flow below the bushing.

4,049,416

METHOD OF JOINING A METAL PART HAVING A COPPER SURFACE AND A GLASS PART

Herman Bloem, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1975, Ser. No. 633,625

Claims priority, application Netherlands, Dec. 19, 1974, 7416556

Int. Cl.[2] C03G *27/02*

U.S. Cl. 65—32 **4 Claims**

1. A method for joining a metal part, of which at least the surface consists of copper, to a glass having a coefficient of expansion suitable for joining to the metal part which comprises the sequential steps of: providing a basic mixture of glass which includes at least one material selected from the group consisting of chromium and copper compounds, the total quantity of materials from said group being between 0.2 and 5% by weight calculated as Cr_2O_3 and CuO respectively; providing a copper exterior surface; holding the copper exterior surface in abutting relationship to said basic mixture of glass; oxidizing the copper exterior surface abutting said mixture of glass in an oxidizing atmosphere at substantially the lowest possible temperature for said oxidizing atmosphere and then heating both said mixture of glass and said exterior surface in a non-oxidizing atmosphere.

4,049,417

ALICYCLIC ALKYLENE POLYAMINE MICROORGANISM AND ALGAE GROWTH INHIBITORS

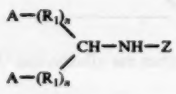
Bruce E. Witzel, Westfield; Nathaniel Grier, Englewood, both of N.J.; Richard A. Dybas, Center Square, Pa., and Robert A. Strelitz, Edison, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 572,592, April 28, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,612

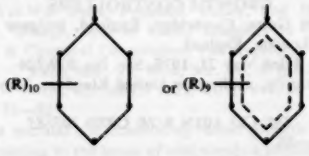
Int. Cl.[2] A01N *9/20*; A61K *31/13*; C07C *87/40, 87/45*

U.S. Cl. 71—67 **25 Claims**

1. A compound having the formula:



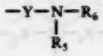
where A is alike or different cyclohexyl or cyclohexenyl of the formula:



where each R is either hydrogen or, C_1 to C_6 alkyl, and the dashed line indicates a single olefinic bond;

each *n* is alike or different and is the integer 0 or 1;

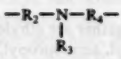
each R_1 is alike or different and is C_1 to C_4 alkylene;



R_5 is hydrogen, aminoethyl, aminopropyl, C_1 to C_4 hydroxyalkyl, or C_2 to C_4 dihydroxyalkyl; and

R_6 is hydrogen, C_1 to C_4 hydroxyalkyl or C_2 to C_4 dihydroxyalkyl;

(a) when Y is



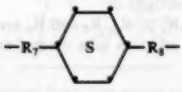
R_2 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

R_3 is hydrogen, C_1 to C_4 alkyl, C_2 to C_4 aminoalkyl, C_1 to C_4 hydroxyalkyl, or C_2 to C_4 dihydroxyalkyl;

R_4 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

or when R_3 and R_6 taken together are ethylene, R_4 is also ethylene, and R_5 is aminoethyl, aminopropyl, or aminohydroxypropyl;

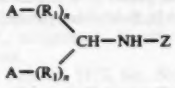
(b) when Y is



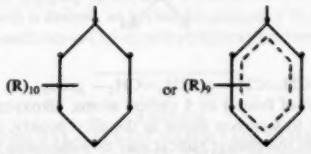
R_7 is R_2, methylene, or a chemical bond between the cyclohexylene moiety and a first nitrogen; R_8 is R_4, methylene, or a chemical bond between the cyclohexylene moiety and a second nitrogen or;

(c). when Y is $—R_2—$, then R_2, R_5 and R_6 are as previously defined, and acid addition salts thereof.

25. A composition for inhibiting the growth of susceptible microorganisms and algae comprising an effective growth inhibiting amount of the compound of the formula:



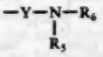
Where A is cyclohexyl or cyclohexenyl of the formula:



where each R is either hydrogen or C_1 to C_6 alkyl, and the dashed line indicates a double bond;

each *n* is alike or different and is the integer 0 or 1;

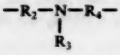
each R_1 is alike or different and is C_1 to C_4 alkylene;



R_5 is hydrogen, aminoethyl, aminopropyl, C_1 to C_4 hydroxyalkyl, or C_2 to C_4 dihydroxyalkyl; and

R_6 is hydrogen, C_1 to C_4 hydroxyalkyl or C_2 to C_4 dihydroxyalkyl;

(a) when Y is



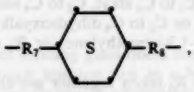
R_2 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

R_3 is hydrogen, C_1 to C_4 alkyl, C_2 to C_4 aminoalkyl, C_1 to C_4 hydroxyalkyl, or C_2 to C_4 dihydroxyalkyl;

R_4 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

or when R_3 and R_6 together are ethylene, R_4 is also ethylene, and R_5 is aminoethyl, aminopropyl, or aminohydroxypropyl;

(b). when Y is



R_7 is R_2, methylene, or a chemical bond between the cyclohexylene moiety and a first nitrogen; R_8 is R_4, methylene, or a chemical bond between the cyclohexylene moiety and a second nitrogen or;

(c). when Y is $-R_2-$, R_2, R_5 and R_6 are as previously defined; and acid addition salts thereof and a carrier.

4,049,418

METHOD OF REGULATING PLANT GROWTH

Helmut Timmler; Wilfried Draber; Karl Heinz Büchel, all of Wuppertal, and Klaus Lürssen, Grosskoenigsdorf, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

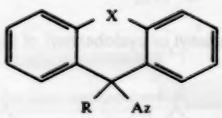
Filed Sept. 19, 1975, Ser. No. 614,987

Claims priority, application Germany, Oct. 9, 1974, 2448060

Int. Cl.² A01N 9/22

U.S. Cl. 71—76 **21 Claims**

1. A method of regulating the growth of plants, which comprises applying to the plants or a habitat thereof an effective amount of a 5-azolyl-[a,d]-dibenzocycloheptene compound of the formula

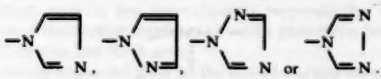


in which

X is a —CH=CH— or CH_2—CH_2— group,

R is alkyl of from 1 to 4 carbon atoms, alkoxycarbonyl of from 1 to 4 carbon atoms in the alkyl moiety, or phenyl, wherein the phenyl radical may be substituted by up to 3 substituents selected from alkyl of from 1 to 4 carbon atoms, halogen, haloalkyl of up to 2 carbon atoms and up to 5 carbon atoms and

Az is an azole radical selected from the formulas



4,049,419

USE OF BENZOTHIAZOLINE COMPOUNDS AS PLANT GROWTH REGULANTS

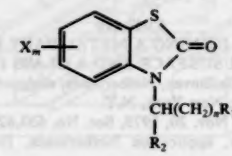
John J. D'Amico, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 576,512, May 12, 1975, Pat. No. 3,993,468. This application Feb. 26, 1976, Ser. No. 660,741

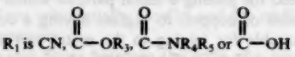
Int. Cl.² A01N 9/12

U.S. Cl. 71—76 **20 Claims**

7. A method for reducing the stature of soybean plants which comprises treating said soybean plants with a stature reducing amount of a compound of the formula



wherein X is halo; *m* is 0 or 1;



and agriculturally acceptable salts thereof; R_2 is H, CN, lower alkyl or

R_3 is lower akyl; R_4 and R_5 are independently H, alkyl or when taken together with the nitrogen molecule form a heterocyclic having up to 8 carbon atoms, inclusive; and *n* is 0 or 2; provided that R_2 is

only when R_1 is

and *n* is 0.

4,049,420

CERTAIN SULFONIC ACID ESTERS OF CERTAIN 2,3-DIHYDRO-2-HYDROCARBONOXY-BENZOFURAN-5-OLS AND THEIR USE AS HERBICIDES AND PLANT GROWTH CONTROLLERS

Peter Stuart Gates, Cambridge, England, assignor to Fisons Limited, London, England

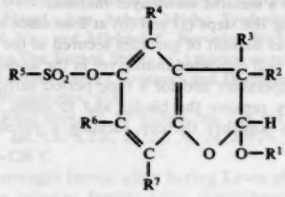
Filed May 21, 1975, Ser. No. 579,726

Claims priority, application United Kingdom, May 31, 1974, 24350/74

Int. Cl.² A01N 9/28; C07D 307/83

U.S. Cl. 71—88 **23 Claims**

1. A compound of the formula



wherein R^1 represents a branched chain alkyl group of 4 to 10 carbon atoms wherein at least the 2-position is branched or cyclohexyl,

R^2 and R^3 are the same or different and each represents a hydrogen atom or an alkyl group of 1 - 6 carbon atoms,

R^4, R^6 and R^7 are the same or different and each represents a hydrogen or halogen atom or an alkyl or alkoxy group of 1 - 4 carbon atoms, and

R^5 represents an alkyl group of 1 - 6 carbon atoms, an alkyl group of 1 - 6 carbon atoms substituted by halogen or alkoxy of 1 - 6 carbon atoms, phenyl, or phenyl substituted by halogen or alkyl of 1 - 4 carbon atoms.

13. A plant growth control composition which comprises an effective amount of a compound according to claim **1** in admixture with at least one member selected from the group consisting of an inert carrier therefor and a surface active agent, said composition being suitable for application to plants or to the locus at which plants are growing or are to grow.

4,049,421

BACTERICIDAL, FUNGICIDAL AND HERBICIDAL 2-(N,N-DIALKYLAMINO)-3,5-DINITROTHIOPHENES

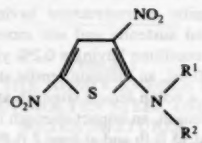
Leroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 566,568, April 9, 1975, Pat. No. 3,978,083. This application June 25, 1976, Ser. No. 699,780

Int. Cl.² A01D *9/12*

U.S. Cl. 71—90 **6 Claims**

1. A method for controlling the growth of undesirable vegetation which comprises applying to the vegetation or the growth medium thereof an herbicidally effective amount of the compound of the formula



wherein R^1 and R^2 individaully are methyl or ethyl.

4,049,422

HERBICIDAL MORPHOLINOBENZIMIDAZOLES

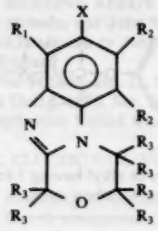
Kelvin Kei-Wei Shen, Fountain Valley, and Wayne Stuart Belles, Orange, both of Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Mar. 29, 1976, Ser. No. 671,452

Int. Cl.² A01N *9/22;* **C07D** *498/04*

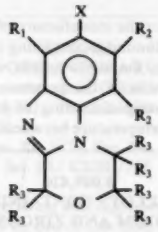
U.S. Cl. 71—92 **18 Claims**

1. The method for controlling weed growth which comprises applying to the locus of said weeds a phytotoxic amount of a compound of the formula



wherein X is selected from the group consisting of halo-lower alkyl, lower alkylsulfonyl, halo-lower alkylsulfonyl, halo and lower alkyl, R_1 represents hydrogen, lower alkyl or halo, each R_2 is selected from hydrogen, halo, lower alkyl, lower alkoxy, cyano, amino and nitro, and each R_3 is selected from hydrogen and lower alkyl.

10. A compound of the formula



in which X is selected from the group consisting of trifluoromethyl, lower alkylsulfonyl, halo-lower alkylsulfonyl and branched chain alkyl of 3 to about 6 carbon atoms, R_1 is hydrogen, lower alkyl or halo, each R_2 is selected from hydrogen, halo, lower alkyl, lower alkoxy, cyano, amino and nitro and each R_3 is selected from hydrogen and lower alkyl.

4,049,423

N-DIMETHYLPROPYNYL-α-METHOXY-α-(3,5-DIMETHYLPHENOXY)ACETAMIDE HERBICIDE

Don R. Baker, Orinda, Calif., and Francis H. Walker, Mill Valley, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed June 30, 1975, Ser. No. 591,721

Int. Cl.² A01N *9/20*

U.S. Cl. 71—118 **1 Claim**

1. The method of controlling undesirable vegetation which comprises applying to the area where control of said vegetative growth is desired, an herbicidal amount of N-dimethylpropynyl-α-methoxy-α-(3,5-dimethylphenoxy)acetamide.

4,049,424

N-T-BUTYL-2-(3,5-DICHLORO OR DIMETHYL PHENOXY)-2-ALKOXY AMIDE HERBICIDES

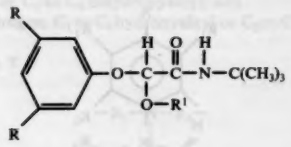
Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed June 30, 1975, Ser. No. 591,687

Int. Cl.² A01N *9/20*

U.S. Cl. 71—118 **5 Claims**

1. The method of controlling undesirable vegetation which comprises applying to the area where control of said vegetative growth is desired an herbicidal amount of a compound having the formula



in which R is halogen or alkyl having 1 to 4 carbon atoms and R^1 is alkyl having 1 to 4 carbon atoms.

4,049,425

PROCESS FOR THE MANUFACTURE OF ALUMINUM

Servaas Middelhoek; Gerhardus Santing, both of Arnhem, and Nicolaas Dost, Bennekom, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 15, 1976, Ser. No. 667,046

Claims priority, application Netherlands, Mar. 21, 1975, 7503385

Int. Cl.² C22C *1/02*

U.S. Cl. 75—135 **8 Claims**

1. In the process for the manufacture of aluminum alloys by reducing an oxidic aluminum-containing material at high temperature with carbon, the improvement which comprises carrying out the reduction in the presence of a catalyst metal selected from the group consisting of iron, nickel, cobalt a mixture thereof at a temperature between 1000° C and 1950° C.

4,049,426

COPPER-BASE ALLOYS CONTAINING CHROMIUM, NIOBIUM AND ZIRCONIUM

W. Gary Watson, Cheshire, and John F. Breedis, Trumbull, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 4, 1976, Ser. No. 728,977

Int. Cl.² C22F *1/08*

U.S. Cl. 75—153 **20 Claims**

1. A copper base alloy which exhibits a combination of high strength and high electrical conductivity, said alloy consisting essentially of 0.05 to 1.25% by weight chromium, 0.05 to 1.0% by weight zirconium, 0.05 to 1.5% by weight niobium, balance copper.

4,049,427

NON-PRECIOUS DENTAL ALLOY

Ricardo Guerra, 112 Bellevue Ave., Oceanside, N.Y. 11572

Filed Oct. 8, 1976, Ser. No. 730,704

Int. Cl.² C22C *19/05*

U.S. Cl. 75—171 **3 Claims**

1. An alloy suitable for dental prosthetic work consisting essentially of, by weight: 14–21% chromium, 8–12% cobalt, 1–1.5% molybdenum, 1–1.5% aluminum, 0.9–1.4% beryllium, 0.8– 1.2% iron, 0.3–0.4% copper, 0.3–0.4% silicon, 0.03–0.05% manganese, balance nickel.

4,049,428

METAL POROUS ABRADABLE SEAL

Raymond John Elbert, Middleburg Heights, and Ernest Gilbert Farrier, Parma, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 128,182, March 25, 1971, abandoned. This application Jan. 28, 1977, Ser. No. 763,535

Int. Cl.² B22F *1/02, 7/02*

U.S. Cl. 75—208 R **10 Claims**

1. A process for producing a metal porous abradable structure comprising the steps:

a. depositing a coating of a binder material onto a substrate to produce a tacky surface layer sufficient to secure metal particles sprinkled thereon against the force of gravity when said layer is inverted,

b. depositing metal particles onto said tacky binder layer to produce a metallic monolayer thereon;

c. repeating the steps (a) and (b) at least once to produce a multilayer deposit of particles secured in the binder; and

d. heating said deposited multilayer in the as-deposited state at a temperature and for a time period sufficient to substantially remove the binder and to sinter the metallic particles together thereby forming a porous abradable structure.

4,049,429

FERRITIC ALLOYS OF LOW FLOW STRESS FOR P/M FORGINGS

Stephen James Donachie, New Windsor, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 345,981, March 29, 1973, Pat. No. 3,864,809. This application Mar. 7, 1974, Ser. No. 448,883

Int. Cl.² C22C *33/02*

U.S. Cl. 75—246 **6 Claims**

1. A consolidated age-hardenable powder metallurgical alloy steel in the ferritic condition particularly adapted for PM/hot forging and characterized by (a) low flow stress, (b) good impact strength, (c) high resistance to fatigue and (d) good flowability such as to fill complex dies, said steel being formed from about 0.7% to about 1% nickel, 1.4% to 2% copper, 0.15% to 0.35% molybdenum, up to 0.02% carbon, up to 0.1% silicon, up to 0.15% manganese, and the balance essentially iron.

4,049,430

PRECIPITATION HARDENABLE STAINLESS STEEL

Lewis P. Myers, Reading, Pa., assignor to Carpenter Technology Corporation, Reading, Pa.

Filed Aug. 18, 1976, Ser. No. 715,619

Int. Cl.² C22C *38/06, 38/42*

U.S. Cl. 75—124 **18 Claims**

1. A chromium-nickel stainless steel alloy capable of being age hardened to a hardness of at least 44 Rockwell C with an essentially martensitic microstructure having no more than about 10% retained austenite and nor more than about 3% ferrite and in that condition having a 0.2% yield strength of at least about 200,000 psi, an ultimate tensile strength of at least about 210,000 psi, a notch tensile strength at least equal to its ultimate tensile strength, an impact strength in the longitudinal direction of at least 15 ft-lb and at least 5 ft-lb in the transverse direction, said alloy in weight percent consisting essentially of about

	w/o
Carbon	up to 0.05
Manganese	up to 0.5
Silicon	up to 0.5
Phosphorus	up to 0.04
Sulfur	up to 0.02
Chromium	10.5–12
Nickel	8.5–9.5
Copper	2.1–3.0
Aluminum	0.7–0.93
Boron	up to 0.01
Columbium	0.20–0.55
Nitrogen	up to 0.04

and the balance essentially iron and incidental impurities.

4,049,431

HIGH STRENGTH FERRITIC ALLOY

William C. Hagel, Ann Arbor, Mich.; Frederick A. Smidt, Springfield, Va., and Michael K. Korenko, Richland, Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 30, 1976, Ser. No. 728,361
Int. Cl.[2] C22C *38/22, 38/24, 38/26*
U.S. Cl. 75—126 C 3 Claims

1. A high strength ferritic alloy having Laves phase precipitation as the primary ferritic alloy strengthener consisting essentially of from about 9% to about 13% by weight chromium, from about 4% to about 8% by weight molybdenum, from about 0.2% to about 0.8% by weight niobium, from about 0.1% to about 0.3% by weight vanadium, from about 0.2% to about 0.8% by weight silicon, from about 0.2% to about 0.8% by weight manganese, from 0.04% to about 0.12% by weight carbon, a maximum of about 0.05% by weight nitrogen, a maximum of about 0.02% by weight sulfur, a maximum of about 0.02% by weight phosphorus, and the balance iron, wherein said alloy will swell less than 5% at the fluence of 2.2 $\times 10^{23}$ n/cm^2 (E > 0.1 MeV) and wherein said alloy exhibits 100 hour stress rupture strength in the range of about 30 ksi at 650° C.

4,049,432

HIGH STRENGTH FERRITIC ALLOY-D53

William C. Hagel, Ann Arbor, Mich.; Frederick A. Smidt, Springfield, Va., and Michael K. Korenko, Richland, Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 30, 1976, Ser. No. 728,362
Int. Cl.[2] C22C *38/44, 38/46, 38/54*
U.S. Cl. 75—128 F 3 Claims

1. A high strength ferritic alloy consisting of from about 0.2% to about 0.8% by weight nickel, from about 2.5% to about 3.6% by weight chromium, from about 2.5% to about 3.5% by weight molybdenum, from 0.1% to about 0.5% by weight vanadium, from about 0.1% to about 0.5% by weight silicon, from about 0.1% to about 0.6% by weight manganese, from about 0.12% to about 0.20% by weight carbon, from about 0.02% to about 0.1% by weight boron, a maximum of about 0.05% by weight nitrogen, a maximum of about 0.02% by weight sulfur, a maximum of about 0.02% by weight phosphorous, and the balance iron.

4,049,433

METHOD FOR THE HOMOGENEOUS DISTRIBUTION OF ALLOYS IN MOLTEN STEEL USING OIL AND WATER MIXTURES

J. Barry Hemphill, Mount Lebanon Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 1, 1976, Ser. No. 728,685
Int. Cl.[2] C22C *33/04*
U.S. Cl. 75—129 4 Claims

1. In the addition of alloy additive fragments to a massive molten metal bath, said addition being effected under conditions in which the degree of stirring of said bath is ineffective in achieving a homogeneous distribution of the additives within the bath,

the improvement for significantly improving the homogeniety of said distribution, which comprises, prior to the addition of the additive to the molten bath, applying an aqueous mixture to said fragments so as to provide an aqueous film thereon, said mixture consisting essentially of 2 to 30 weight percent oil dispersed in water.

4,049,434

BRAZING ALLOY

Mieczyslaw Herman Sloboda, and John Sidney Hatswell, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Continuation of Ser. No. 542,865, Jan. 21, 1975, abandoned. This application Oct. 5, 1976, Ser. No. 729,720
Claims priority, application United Kingdom, Jan. 24, 1974, 3343/74
Int. Cl.[2] C22C *9/04, 30/02*
U.S. Cl. 75—134 C 2 Claims

1. A razing alloy consisting essentially of 33 wt.% wt.% zinc, 25 wt.% silver, 2wt.% manganese, 2 wt.% nickel and 38 wt.% copper, said allow melting in the range 710–810° C and being characterized by its resistance to cracking on cooling when used to braze the joint between a steel shank and carbide cutting tip of a rock drill.

2. A brazing alloy consisting essentially of 38 wt.% zinc, 2 wt.% manganese, 2 wt.% wt.% cobalt and 58 wt.% copper, said alloy melting in the range 890°–930° C and being characterized by its resistance to cracking on cooling when used to braze the joint between a steel shank and carbide cutting tip of a rock drill.

4,049,435

METHOD FOR OBTAINING A LUMP PRODUCT

Valery Efimovich Lotosh, ulitsa Chkalova, 34, and Vladimir Demyanovich Steblyak, ulitsa Shmidta, 76, kv. 32, both of Sverdlovsk, U.S.S.R.

Filed Apr. 22, 1976, Ser. No. 679,359
Int. Cl.[2] C22B *1/08*
U.S. Cl. 75—3 5 Claims

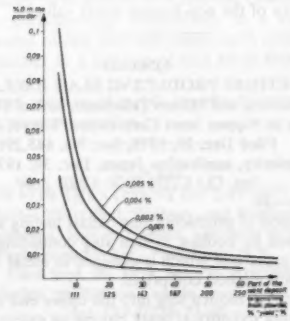
1. A method for preparing a strengthened pelleted ore product, which comprises an ore of less than 1 mm in size with a hydraulic binder, simultaneously homogenizing and activating the mixture, pelleting the mixture to obtain green pellets, steaming the green pellets at a temperature of 60°–250° C and a relative humidity of 70–100%, heat treating the pellets at a first temperature of 70–100° C until the free moisture content of the pellets is 2-5%, and adjusting to a second heat treatment temperature of from at least 100° to 900° C until the free moisture content of the pellets is 0.01 to 1.0% thereby obtaining a strengthened ore pellet product.

4,049,436

BORON ALLOYED IRON POWDER FOR FILLER METALS

Gert H. von Scheele, Arild, Sweden, assignor to Hoganas AB, Hoganas, Sweden

Filed June 23, 1975, Ser. No. 589,449
Claims priority, application Sweden, June 24, 1974, 7408230
Int. Cl.[2] C22C *33/02, 38/32*
U.S. Cl. 75—.5 R 8 Claims



1. Iron based weld filler powder to be used either in the as

condition or diluted with a boron free unalloyed iron powder as a raw material in the production of filler metals such as stick electrodes, agglomerated fluxes, flux cored wires, characterized in that it contains boron within the limits 0.03% and 0.07%.

4,049,437

PROCESS OF SEPARATION, PARTICULARLY OF A SOLID PHASE, FROM A MATRIX IN LIQUID PHASE

Jean Driole; Colette Allibert; Etienne Bonnier, all of Grenoble, and Alain Wicker, Limours, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed July 14, 1976, Ser. No. 705,029

Claims priority, application France, July 18, 1975, 75.22556

Int. Cl.[2] C22B *4/00, 7/00*

U.S. Cl. 75—10 R **9 Claims**

1. In a process of establishing separate phases in a mixture by cooling thereof from a relatively high temperature under which the mixture is maintained as a substantially homogenous melt, a method of accelerating said cooling to a lower temperature at which the separate phases coexist within a liquid matrix, comprising the steps of: generating an oscillating magnetic field; and applying said magnetic field to substantially the entire mass of the mixture during said cooling thereof until at least one of the separate phases is formed within a predetermined zone of the liquid matrix.

4,049,438

NON-FERROUS METAL RECOVERY FROM DEEP SEA NODULES

Ramamrithan Sridhar, Mississauga; John Stuart Warner, Oakville, and Malcolm Charles Evert Bell, Sudbury, all of Canada, assignors to The International Nickel Company, Inc., Del.

Filed Feb. 14, 1975, Ser. No. 549,978

Claims priority, application Canada, Mar. 11, 1974, 194558/74; Aug. 2, 1974, 206227/74

Int. Cl.[2] C21B *1/00*

U.S. Cl. 75—21 **31 Claims**

1. A process for recovering at least one non-ferrous metal value selected from the group consisting of nickel, cobalt, copper or molybdenum, which non-ferrous metal value is present as an oxide, from a manganiferous oxide material which process comprises selectively reducing said non-ferrous metal values and then smelting the manganiferous oxide material to produce a first molten alloy containing a preponderant part of the non-ferrous metal values and a first manganese-containing slag, separating the first molten alloy from the first manganese-containing slag, blowing the separated molten first alloy with a free-oxygen-containing gas to oxidize and slag most of the manganese contained in the first molten alloy and to form a second molten alloy further depleted in manganese and a second manganese-containing slag, separating the second molten alloy from the second manganese-containing slag, and then sulfiding the second molten alloy to facilitate separation and recovery of the non-ferrous metal values.

4,049,439

METHOD PRODUCING SLAG BALLAST

Kunio Nakamura, and Mitsuo Takahashi, both of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 29, 1975, Ser. No. 645,291

Claims priority, application Japan, Dec. 30, 1974, 50-2403

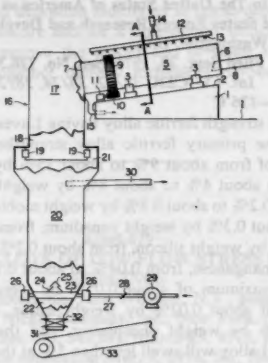
Int. Cl.[2] C21B *3/04;* C22B *7/04*

U.S. Cl. 75—24 **8 Claims**

1. A method of producing slag ballast having a low S^{2-} ion concentration by cooling molten slag containing a high proportion of sulfur and which is obtained in metal smelting processes, which method comprises:

a. introducing molten slag into the upper end of an inclined revolving cylindrical body having an external peripheral cooling surface;

b. cooling the said external peripheral surface for cooling the slag at a cooling rate in excess of 20° C/min. until solidification of the slag takes place for reducing the S^{2-} ion concentration of the cooled slag to a level not exceeding 5 ppm;



c. moving the solidified slag forward and tumbling the slag in the revolving cylindrical body as it is being cooled for crushing the slag; and

d. discharging the cooled, broken and lumpy slag from the revolving cylindrical body through the lower end thereof.

4,049,440

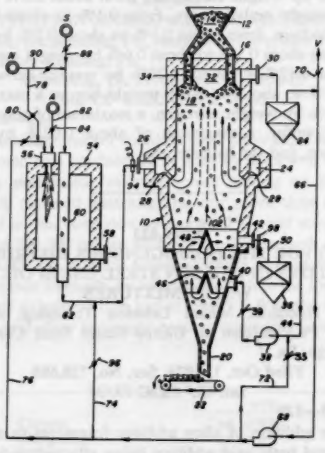
METHOD FOR PRODUCING METALLIC IRON PELLETS

Donald Beggs, Charlotte, N.C., assignor to Midrex Corporation, Charlotte, N.C.

Continuation-in-part of Ser. No. 578,477, May 19, 1975. This application Sept. 8, 1975, Ser. No. 611,099

Int. Cl.[2] C21B *13/00*

U.S. Cl. 75—35 **19 Claims**



1. A method for producing a metallized product comprising:

a. establishing a gravitational flow of particulate metal oxide material by charging the particulate metal oxide material to the upper portion of a generally vertical furnace having an upper reducing zone and a lower cooling zone, and removing the metallized product from the bottom of the furnace;

b. introducing a reducing gas to the gravitational flow of material at a temperature sufficient to promote a reducing

reaction between said reducing gas and said material at a first inlet intermediate the ends of the furnace;

c. causing said reducing gas to move countercurrent through the gravitational flow of material, react with and reduce a substantial portion of the metal oxide and form a top gas;

d. removing said top gas from the upper portion of the furnace;

e. cooling said top gas;

f. introducing a cooling gas into a second inlet near the lower end of said furnace;

g. removing a portion of said cooling gas from said furnace at a location intermediate said first and second inlets;

h. cooling the removed portion;

i. introducing the cooled removed portion to said second inlet to form a recirculating circuit including the cooling zone;

j. adding cooled top gas to said recirculating circuit; and

k. causing a second portion of said cooling gas, in an amount substantially equal to the amount of cooled top gas added to said recirculating circuit, to flow upwardly through the gravitational flow of material, become heated thereby, and to flow into and act as a reducing gas in the reducing zone;

whereby, that portion of said cooling gas flowing upwardly through the gravitational flow of material has a greater reducing potential than the spent top gas, and is thus an effective reductant.

4,049,441

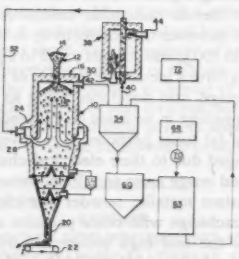
METHOD OF EXTENDING THE LIFE OF A CATALYST IN A PROCESS OF PRODUCING METALLIC IRON PELLETS

Charles M. Jaco, Jr., Clover; Wallace C. Menear, Georgetown, and Donald W. Clark, North Litchfield Beach, all of S.C., assignors to Midrex Corporation, Charlotte, N.C.

Filed Mar. 4, 1976, Ser. No. 663,949

Int. Cl.² C21B *13/00*

U.S. Cl. 75—35 **3 Claims**



1. In a method of producing metallic iron pellets by direct reduction of particulate iron oxide material with hot reducing gas in a reducing furnace having a reducing zone therein, removing reacted sulfur-containing gas, cooling said reacted gas in a cooler-scrubber, reforming said reacted gas into an effective reductant, and reintroducing gas to the reducing zone as reducing gas, the improvement comprising adding a sulfur-removing reagent comprising an aqueous solution of zinc chromate having a free metallic ion which forms an insoluble precipitate with sulfur to cooling water, and contacting said reacted gas with said reagent-containing water in said cooler-scrubber, whereby a substantial portion of sulfur is removed from said gas by said reagent.

4,049,442

COMPOSITION FOR DESULFURIZING IRON MELTS

Alfred Freissmuth, Trostberg; Walter Heinl, Garching; Herbert Knahl, and Erich Pfluger, both of Trostberg, all of Germany, assignors to Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft, Trostberg, Germany

Filed Jan. 6, 1976, Ser. No. 646,778

Claims priority, application Germany, Jan. 8, 1975, 2500497

Int. Cl.² C21C *7/00*

U.S. Cl. 75—55 **8 Claims**

1. Composition for desulfurizing iron melts in torpedo ladles, comprising a mixture of calcium carbide and diamide line in which the content of diamide lime is from more than 40% by weight up to 70% by weight of the mixture.

4,049,443

METHOD OF FABRICATION OF AN ALLOY CONTAINING AN ALKALI METAL AND/OR AN ALKALINE-EARTH METAL

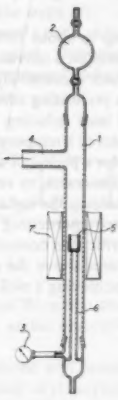
Andre Hatterer, Riedisheim; Claude Oberlin, Avon, and Pierre Strobel, Mulhouse, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 487,540, July 11, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,858

Claims priority, application France, July 31, 1973, 73.28045

Int. Cl.² C22B *26/10*

U.S. Cl. 75—66 **17 Claims**



1. A method of producing an alloy containing an alkali metal, an alkali-earth metal and a metal co-component alloyable thereiwth, comprising:

confining at least one alkali metal nitride, at least one alkali-earth metal nitride and at least one metallic co-component of the alloy to be formed in a reaction chamber;

thermally decomposing, substantially in a vacuum, said alkali metal nitride and said alkali-earth metal nitride in said chamber to a mixture of said alkali and alkali-earth metals, and

melting said mixture of metals thereby forming a substantially homogeneous alloy.

4,049,444

PROCESS FOR TREATMENT OF LATERITIC ORES

Malcolm Charles Evert Bell, Sudbury, and Ramamritham Sridhar, Mississauga, both of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,549

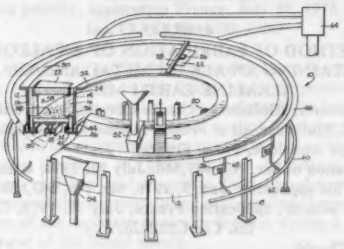
Claims priority, application Canada, Nov. 5, 1973, 185029

Int. Cl.² C22B *23/00*

U.S. Cl. 75—82 **18 Claims**

1. In a thermal upgrading process for treating nickeliferous

lateritic ores containing a silicate to limonite ratio of at least about 1:4 which comprises: forming agglomerates of the particulate nickeliferous lateritic ore, a reducing agent and a reagent containing at least one member selected from the group consisting of alkali metal compounds and alkaline earth metal compounds; heating said agglomerates to reduce nickel values in the ore to metallic nickel and to coalesce the reduced nickel values into ferronickel particles; the improvement comprising: employing said reducing agent in the agglomerates in an amount of up to about 12% by weight, said reducing agent containing at least about 1% by weight liquid hydrocarbon, the amount of reducing agent based on the weight of the ore, utilizing said reagent in a small but effective amount for improved nickel recovery up to about 10%; establishing a shallow bed of the agglomerates on a movable hearth; moving the shallow bed of agglomerates successively and rapidly through a confined space having a preheating zone and a reducing zone having an atmosphere at least reducing to nickel oxide while subjecting the agglomerates to a temperature of between about 1295° and about 1320° C for a period of up to about 30 minutes to partially melt the agglomerates, to reduce nickel values to metallic nickel, and to coalesce the reduced nickel values into ferronickel particles; thereby permitting continuous treatment of said nickeliferous lateritic ore containing a substantial silicate fraction at temperatures above the softening temperature of the agglomerates and achieving a nickel recovery of at least over 80%.



4,049,445

METHOD FOR THERMAL TREATMENT OF NICKEL ORE

Horst Weigel, Cologne, Germany, and Anton Spitz, deceased, late of Cologne, Germany, by Barbara Wilhelmine Spitz nee Schürmann, legal representative, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Nov. 6, 1975, Ser. No. 629,321

Claims priority, application Germany, Nov. 12, 1974, 2453564

Int. Cl.² C22B *23/02*

U.S. Cl. 75—82 **9 Claims**

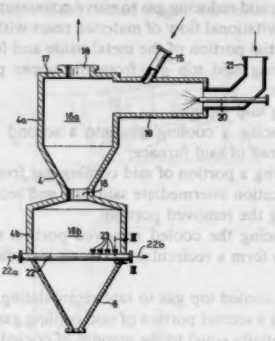
1. The method of thermally processing lateritic nickel ore which comprises:

preheating the ore in a preheating zone;

feeding the preheated ore to a heating zone and then to a reduction zone;

supplying a reducing gas to said reduction zone;

feeding the reducing gas from the reduction zone and a fuel/air mixture to said heating zone whereby the still combustible reduction gases are burned in direct contact with the ore and the temperature of the ore is raised by the hot gases to a selected reduction temperature; and



conducting the hot, burned reduction gases and fuel/air mixture to said preheating zone for preheating the ore.

4,049,446

ENERGIZED LIQUID DEVELOPERS FOR DEVELOPING ELECTROSTATIC IMAGES

Kenneth A. Metcalfe, 1 Corona Avenue, Lockleys, South Australia 5032; Clive Westgarth Wilson, 23 Bowden Grove, Oaklands Park, South Australia 5045, and Denton Field, 23 Nyonga Avenue, Croydon Park, South Australia 5008, all of Australia

Division of Ser. No. 401,966, Sept. 28, 1973, abandoned. This application Feb. 9, 1976, Ser. No. 656,822

Claims priority, application Australia, Oct. 4, 1972, 691/72

Int. Cl.² G03G *13/10*

U.S. Cl. 96—1 LY **2 Claims**

1. A method of developing electrical field images which comprises applying a developer to a base material having a coating comprising a photosensitive medium and a resin having embedded therein particulate conductive particles or a medium which increases the conductivity in the proportion by weight of 100 to 500 grams of resin to 0.5 to 2 grams of conductive material to form a membrane capable of sustaining a latent electrostatic image, said developer being an energized liquid developer comprising in separate co-existence within an insulating liquid of (a) toner particles of relatively low dielectric constant arranged due to their electrical characteristic to deposit on selected image areas and (b) movement-inducing high dielectric constant metallic powder particles which have a rapid charge exchange with other particles and adjacent surfaces to cause the said high dielectric particles to oscillate between other particles and the said surfaces whereby by collisions of said particles and the toner particles to introduce random agitation of particles in the liquid and by the presence of the photoconductive particles in the photosensitive base, and the metallic particles in the carrier liquid of the developer, agitation is enhanced at the interface between the liquid and the photoconductor due to charge exchange between the fixed conductive particles in the photoconductor and the moving metal particles in the developer liquid, maintaining said body of developer itself quiescent except for the random particle movement, said toner particles being colored resin particles, said metal powders being selected from the group consisting of aluminum, bronze powder, zinc powder, aluminum powder, copper powder, intermetallic compound powder, tin powder, iron powder, and chromium powder.

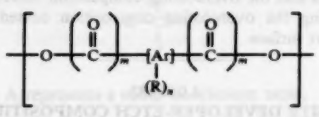
4,049,447
IMAGING SYSTEM

Jack C. Azar, Rochester; Thomas A. Hoffend, Webster, both of N.Y., and Burton B. Jacknow, Monte Sereno, Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 211,131, Dec. 22, 1971, abandoned. This application Feb. 12, 1976, Ser. No. 657,504
Int. Cl.[2] G03G 9/08, 13/08, 13/22
U.S. Cl. 96—1 SD 23 Claims

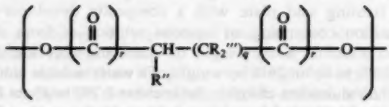
1. A finely divided particulate toner composition consisting essentially of a colorant and an amorphous, low-melting polyester exhibiting a softening temperature of at least about 45° C, fusing at temperatures ranging from about 100° to about 130° C and exhibiting a resistivity of at least about 10^{15} ohm - cm.), wherein the polyester contains within the polymer chain at least about 30 mole percent of at least one divalent radical selected from the group consisting of:

a. an arylene radical represented by the formula:



wherein [AR] is an arylene radical containing from 6 to about 18 carbon atoms, R is selected from the group of radicals consisting of hydrogen, alkyl containing from 1 to about 4 carbon atoms, halo, sulfo and alkali metal salts thereof, nitro, cyano, lower alkoxy, amino, thio lower alkoxy and $-N(R')_p$ wherein each R' can be independently hydrogen or lower alkyl and p is an integer of 2 or 3, each m is independently a number from 0 to 1 and n is a number from 0 to 3, and

b. an alkylene radical having no center of symmetry represented by the structural formula:



wherein R'' is an alkyl radical containing from 1 to about 4 carbon atoms, each R''' is independently hydrogen or R'', q is a number from 1 to about 10 and each r is independently a number from 0 to 1; and when the radical having no center of symmetry is at least about 30 mole percent of said arylene, the balance of the polyester is aromatic or aliphatic comonomer or both, and when the radical having no center of symmetry is at least about 30 mole percent of said alkylene, the balance of the polyester is at least about 20 mole percent aromatic comonomer, and additional aromatic comonomer or aliphatic comonomer or both.

4,049,448
PROCESS FOR PRODUCING AN ELECTROPHOTOGRAPHIC MATERIAL IN WHICH A PINHOLE-FILLING DISPERSION IS EMPLOYED

Satoru Honjo, and Masaaki Takimoto, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 368,789, June 11, 1973, Pat. No. 3,911,170. This application July 8, 1975, Ser. No. 594,176
Claims priority, application Japan, June 9, 1972, 47-57398
Int. Cl.[2] G03G 5/00
U.S. Cl. 96—1.5 R 21 Claims

1. In a process for producing an electrophotographic light-sensitive material comprising coating a paper support with an electroconductive layer and a photoconductive layer on the opposite side of said electroconductive layer, and directly coating on said paper support at least one film-forming resin layer, wherein said film-forming resin layer can be said electroconductive layer, the improvement which comprises bringing at least one film-forming resin layer directly coated on the support into contact with a pinhole-filling dispersion comprising a volatile liquid and a finely dispersed substance selected from the group consisting of a white or black pigment, a plastic particle or a pigment coated with a plastic therein, said liquid easily penetrating into the interior of the paper support through pinholes in said film forming resin layer and carrying said finely dispersed substance into said pinholes, whereby said finely dispersed substance fills and seals said pinholes which permit the penetration of said liquid and which exist in the surface of said film-forming resin layer which is itself capable of substantially completely preventing penetration of said liquid into said paper support and wherein the rate of penetration of said pinhole-filling dispersion is from about 2×10^{-4}mm^3 to about 60×10^{-4}mm^3/second.

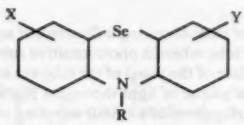
4,049,449
METHOD FOR FORMING AN ELECTROPHOTOGRAPHIC MEMBER

Dana G. Marsh, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 22, 1976, Ser. No. 754,132
Int. Cl.[2] G03Q 5/08
U.S. Cl. 96—1.5 R 2 Claims

1. A method for preparing an electrophotographic imaging member comprising the steps of:

a. providing a layer of a solid phase dispersion on a conductive substrate, said dispersion comprising an organoselenium compound which is represented by the structural formula



wherein

R has from 1 to about 20 carbon atoms and may be alkyl, aryl substituted alkyl, amino derivatives of alkyl and aryl substituted alkyl;

aryl, alkyl substituted aryl, amino substituted aryl, alkylamino substituted aryl, arylamino substituted aryl, alkylcarbonyl, arylcarbonyl, and aminosubstituted derivatives of alkylcarbonyl and arylcarbonyl; and

X and Y are independently selected from the group consisting of H and alkyl and perfluoroalkyl having from 1 to about 4 carbon atoms in an electrically insulating polymeric binder matrix; and

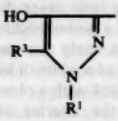
b. subjecting said layer to sufficient thermal energy or electromagnetic radiation to which said organoselenium compound is responsive to decompose at least a substantial amount of said organoselenium compound whereby elemental selenium and a carbazole derivative are deposited within said layer.

4,049,450
4-HYDROXYPYRAZOLE DEVELOPING AGENTS

Richard B. Greenwald, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 30, 1976, Ser. No. 671,741
Int. Cl.[2] G03C 5/54, 5/38, 5/30, 1/48
U.S. Cl. 96—29 R 23 Claims

1. A method of developing a silver halide emulsion which comprises treating an exposed silver halide emulsion layer carried on a support with an aqueous alkaline processing composition of a silver halide developing agent of the formula



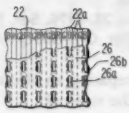
wherein R^1 is selected from hydrogen and hydroxy and R^2 and R^3 each is selected from phenyl, 2-thienyl and alkyl.

4,049,451

METHOD FOR FORMING A COLOR TELEVISION PICTURE TUBE SCREEN

Harold Bell Law, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 14, 1972, Ser. No. 217,885
Int. Cl.[2] G03C *5/00*
U.S. Cl. 96—36.1 **2 Claims**



1. A method of manufacturing a fluorescent screen for use in a colour picture tube wherein photosensitive substances coated on the inner surface of the panel of the tube are exposed to light emanated from a source of light through a plurality of parallel stripe shaped perforations of a colour selecting member each of which is divided into a plurality of slit shaped sections by means of bridges extending at substantially right angles with respect to the longitudinal direction of said perforation thereby forming a fluorescent screen including a plurality of parallel stripes of three colour phosphors, said perforations extending over substantially the entire length of one side of said colour selecting member, improvement in which said fluorescent screen is formed by projecting the exposure light emanated from a linear light source upon said photosensitive substances through said divided slit shaped sections, said linear light source being positioned parallel to said perforations and having an effective length sufficient to expose continuous stripes corresponding to said perforations on said photosensitive substances including the regions behind said bridges.

4,049,452

REVERSE-PRINTING METHOD FOR PRODUCING CATHODE-RAY-TUBE-SCREEN STRUCTURE

Edith Mayaud Nekut, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 23, 1975, Ser. No. 570,618
Int. Cl.[2] B05D *3/06*
U.S. Cl. 96—36.1 **9 Claims**

1. A method for preparing a luminescent-screen structure of a cathode-ray tube, the steps comprising,

a. coating a support surface with a film of a polymeric material whose solubility is altered when it is exposed to radiant energy, said film containing about 5 to 8 weight percent of at least one member of the group consisting of diol alkanes having the molecular formula

$$HO-CH_2-(CH_2)_m-CH_2-OH$$

where m is an integer in the range of 2 to 5 and diol ethers having the molecular formula

$$HO-CH_2-(CH_2-O-CH_2)_n-CH_2-OH$$

where n is an integer in the range of 1 to 5,

b. exposing said film to an image in the form of radiant energy until the solubility of the irradiated regions thereof is selectively altered, thereby producing in said film regions of greater solublity and regions of lesser solubility,

c. removing those regions of said film with greater solubility thereby baring the areas of the support surface underlying said regions of greater solubility, while retaining those regions of said film of lesser solubility,

d. coating said bare areas of said support surface and said retained film regions with a composition containing particles of screen-structure material,

e. and then removing at least a portion of said retained film regions and the overcoating composition thereon, while retaining the overcoating composition coated on said support surface.

4,049,453

COMPOSITE DEVELOPER-ETCH COMPOSITION FOR CHROMIUM-PLATED LITHOGRAPHIC PRINTING PLATES

Vincent A. Pagliaro, and Richard G. Walters, both of Racine, Wis., assignors to Printing Developments, Inc., New York, N.Y.

Division of Ser. No. 567,521, April 14, 1975, Pat. No. 4,022,619. This application June 14, 1976, Ser. No. 695,369
Int. Cl.[2] G03C *5/00, 5/24*
U.S. Cl. 96—36.3 **6 Claims**

1. A single step process for both developing and etching a chromium-plated lithographic printing plate having a light exposed photosensitive resist gum coating thereon which comprises treating said plate with a composite developer-etch composition comprising an aqueous solution of from about 16% to about 22% by weight of aluminum chloride, from about 20% to about 26% by weight of a water-soluble chloride other than aluminum chloride, from about 2.2% to about 4.0% by weight of 85% strength phosphoric acid, from about 0.6% to about 1.4% by weight of an acid-stable water-soluble alkali metal or alkali earth metal hypophosphite reducing agent and the balance water; said composition having a specific gravity at 70° F. of from about 1.4 to about 1.5.

4,049,454

COLOR RADIOGRAPHY

Marcel Karel Van Doorselaer, Gravenwezel, and Romain Henri Bollen, Hove, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Aug. 26, 1975, Ser. No. 607,937
Claims priority, application United Kingdom, Sept. 3, 1974, 38487/74
Int. Cl.[2] G03C *7/00, 1/76, 1/92*
U.S. Cl. 96—55 **19 Claims**

1. A photographic material, which comprises on both sides of a film support at least one silver halide emulsion layer incorporating at least one colour coupler that is capable of forming with an oxidized p-phenylenediamine type colour developing agent a dye, said colour coupler(s) being present in an amount sufficient to allow by exposure and colour development with a p-phenylene diamine developing agent to obtain a spectral density in the material of at least 2.0 with respect to visual filter light, the aggregate amount of silver halide in said material being equivalent to an amount of silver nitrate in the range of 5 g to 1.3 g of silver nitrate per sq.m., the silver halide grain size distribution being such that at least 50% by weight of the silver halide at both sides of the support has a mean grain size smaller than 0.55 μm.

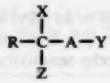
4,049,455

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

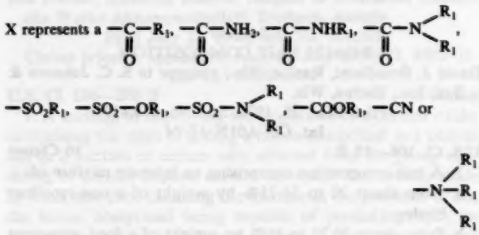
Shoji Kikuchi; Ryosuke Satoh; Takaya Endo, and Katsunori Kato, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed July 26, 1976, Ser. No. 708,298
Claims priority, application Japan, Aug. 15, 1975, 50-99274
Int. Cl.[2] G03C *1/48, 1/06*
U.S. Cl. 96—76 R **6 Claims**

1. A light-sensitive silver halide photographic material having a support and at least a silver halide emulsion layer coated thereon, said material containing a development inhibitor releasing compound which forms substantially a colorless compound and simultaneously releases a development inhibitor on reaction with an oxidation product of a color developing agent and has the following formula:



wherein A represents a sulfur or selenium atom;



radical, wherein R_1 represents (1) a saturated or unsaturated aliphatic radical having up to 18 carbon atoms, (2) an aryl radical selected from the group consisting of phenyl and naphthyl, or (3) a 5–6 membered heterocyclic radical, and (4) two of R_1 can form together a 5–6 membered heterocyclic ring;

R represents (1) an alkyl radical having up to 18 carbon atoms, (2) an aryl radical selected from the group consisting of phenyl and naphthyl, (3) a 5–6 membered heterocyclic radical, (4) a -A-Y radical, (5) a halogen atom, or (6) a -O-W radical, wherein W represents an alkyl radical having up to 5 carbon atoms, an aryl radical selected from the group of a phenyl and naphthyl, a lower acyl radical having up to 5 carbon atoms or a 5–6 membered heterocyclic radical;

Z represents a halogen atom;

Y represents a radical forming a development inhibitor with the sulfur or selenium atom and is selected from the group consisting of a heterocyclic mercapto compound, an aromatic mercapto compound, a heterocyclic seleno compound and an aromatic seleno compound when the thioether or selenoether bond is split off.

4,049,456

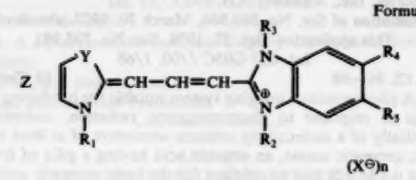
LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Takeo Koitabashi, and Hideo Akamatsu, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

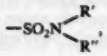
Filed Apr. 7, 1976, Ser. No. 674,599
Claims priority, application Japan, Apr. 14, 1975, 50-45466
Int. Cl.[2] G03C *1/14*
U.S. Cl. 96—84 R **15 Claims**

1. A light-sensitive silver halide color photographic material comprising a support and a red sensitive layer which comprises, in the layer, at least one of the sensitizing dyes represented by the following formula I, at least one of the sensitizing dyes represented by the following formula II and at least one compound represented by the following formula III:

Formula I:

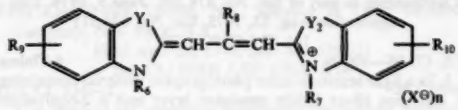


wherein Z is the non-metalic atoms necessary to form a benzene or naphthalene ring which may have substituents selected from the group consisting of lower alkoxy, halogen, lower alkyl, and phenyl; Y is sulfur or selenium; R_1 and R_2 are individually alkyl, sulfoalkyl, carboxyalkyl, alkoxyalkyl, hydroxyalkyl or aralkyl and at least one of R_1 and R_2 is carboxyalkyl or sulfoalkyl; R_3 is alkyl, acyloxyalkyl, aryl or aralkyl; R_4 is hydrogen or halogen; R_5 is halogen, —COOR',



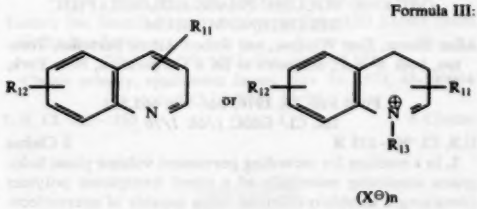
$-CF_3$ or $-SO_2CF_3$ (in which R' is alkyl of 1 to 4 carbon atoms); X is an anion and *n* is 0 or 1, and an inner salt is formed when *n* is 0;

Formula II:



wherein Y_1 and Y_2 are individually sulfur or selenium; R_6 and R_7 individually represent a substitutent selected from the same group as defined in R_1 and R_2; R_8 is lower alkyl; R_9 and R_{10} are individually hydrogen, halogen, alkyl, alkoxy or aryl; X is an anion and *n* is 0 or 1, and an inner salt is formed when *n* is 0;

Formula III:



wherein R_{11} and R_{12} are individually selected from the group consisting of hydrogen, halogen, lower alkyl, alkoxy, aryl, aralkyl, cyano, amino, lower alkyl-substituted amino, carbonylalkyl, sulfoalkyl, acyloxyalkyl or hydroxyalkyl; R_{13} is lower alkyl, aralkyl, hydroxyalkyl, carboxyalkyl, sulfoalkyl or lower alkoxy alkyl; X is an anion; and *n* is 0 or 1, provided that an inner salt is formed when *n* is 0.

4,049,457

PHOTOSENSITIVE COMPOSITION OF POLYNITRATE ESTER, AROMATIC AMINES AND ORGANIC ESTERS

John F. Rice, Nashua, N.H.; Albert P. Yundt, Medfield, Mass., and Kenneth J. Quast, Milford, N.H., assignors to Bard Laboratories, Inc., Amherst, N.H.

Continuation of Ser. No. 560,566, March 20, 1975, abandoned. This application Oct. 27, 1976, Ser. No. 735,951
Int. Cl.[2] G03C 1/00, 1/68
U.S. Cl. 96—88 10 Claims

1. A photosensitive imaging system suitable for producing an image in response to electromagnetic radiation, consisting essentially of a molecularly intimate admixture of at least one basic, aromatic amine, an organic acid having a pKa of from about 0.1 to 3.5, and an oxidizer for the basic aromatic amine, said oxidizer consisting essentially of a polymer polynitrate ester, the aromatic amine comprising a compound of the following formula:

wherein R is an aromatic nucleus substituted either directly or by nitrogen or oxygen bonds with members of the group of hydrogen, halogen, alkyl, aryl and alkaryl groups, and X and Y are selected from the group of hydrogen, hydroxyl, provided that X and Y are not both hydroxyl, alkyl, aryl and alkaryl groups, such that said aromatic amine is relatively basic, such basicity not being substantially nullified by salt or amide formation.

4,049,458

PHOTOGRAPHIC SILVER HALIDE MATERIAL CONTAINING 2-EQUIVALENT YELLOW COUPLERS

Immo Bole, Cologne, and Dieter Lowski, Bergheim Erft, both of Germany, assignors to AGFA-Gevaert, A.G., Germany

Continuation-in-part of Ser. No. 476,388, June 5, 1974. This application Aug. 13, 1975, Ser. No. 604,311
Int. Cl.[2] G03C 1/40
U.S. Cl. 96—100 N 4 Claims

1. In a light sensitive color photographic material containing at least one silver halide emulsion layer and a 2-equivalent yellow coupler having an activated open-chain ketomethylene coupler structure in which one hydrogen of the methylene group is substituted by a nitrogen of a heterocyclic group which group is photographically relatively inert except that it is split off during chromogenic development, the improvement according to which the splittable group is a monocyclic pyrrole, 1,2-diazole, 1,3-diazole or 1,2,3-triazole group attached to the coupling position of the yellow coupler.

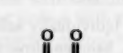
4,049,459

ORGANIC VOLUME PHASE HOLOGRAPHIC RECORDING MEDIUM

Allen Bloom, East Windsor, and Robert Alfred Bartolini, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

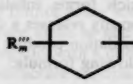
Filed Feb. 26, 1976, Ser. No. 661,521
Int. Cl.[2] G03C 1/68, 1/76
U.S. Cl. 96—115 R 5 Claims

1. In a medium for recording permanent volume phase holograms consisting essentially of a cured transparent polymer containing a soluble α-diketone being capable of intermolecular hydrogen atom abstraction and which has the formula



wherein R and R′ independently are selected from the group consisting of methyl, branched-chain alkyl and cyclic hydrocarbon groups wherein the carbon atoms are part of an aromatic or aliphatic ring and R and R′ together can form part of an aromatic or aliphatic ring; and x is an integer of 1 or 2; and said α-diketone being present in an amount sufficient to cause a change in the index of refraction when illuminated by a spatially modulated coherent light beam having a wavelength corresponding to the absorption band wavelength tail of said α-diketone, the improvement which comprises:

utilizing as said cured transparent polymer a vinyl benzene polyester polymer wherein said polymer is a reaction product of an unsaturated polyester and a vinyl benzene which has the formula



wherein R″ is a vinyl or an alkyl substituted vinyl group, R‴ is a C_{1-5} alkyl group, n is an integer of 1–3, and m is an integer of 0–2; whereby sensitivity is increased.

4,049,460

ROACH BAIT COMPOSITION

David J. Broadbent, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Mar. 25, 1976, Ser. No. 670,477
Int. Cl.[2] A01N 17/14
U.S. Cl. 106—15 R 10 Claims

1. A bait composition comprising an intimate mixture of:

a. from about 20 to 54.75% by weight of a non-repellent binder;

b. from about 79.75 to 45% by weight of a food attractant selected from the group consisting of dry dog food, maltose, brown sugar, or mixtures thereof; and

c. from about 0.25 to 5% by weight of 0,0-diethyl-0-(3,5,6-trichloro-2-pyridyl) phosphorothioate.

4,049,461

UNFIRED, REFRACTORY, BASIC BRICKS AND COMPOSITIONS AND THEIR METHOD OF MANUFACTURE

Günther Lorenz Mortl, Villach; Eckhart Werthmann, and Günther Zoglmeyr, both of Radenthein, all of Austria, assignors to Osterreichisch-Amerkianische Magnesit Aktiengesellschaft, Radenthein, Austria

Filed Mar. 27, 1973, Ser. No. 345,315
Claims priority, application Austria, Mar. 31, 1972, 2814/72
Int. Cl.[2] C04B 35/04, 35/52
U.S. Cl. 106—56 8 Claims

1. A process of producing an unfired, refractory, basic composition consisting essentially of refractory material of either magnesia, dolomite, lime or mixtures thereof, together with a carbonaceous binder and elementary carbon by mixing the refractory material with the carbonaceous binder and the elementary carbon, which comprises using an amount of elementary carbon in dependence on the Fe_2O_3 content of the refractory material so that elementary carbon is used, based on the weight of the refractory material, in an amount of from 0.8 to at most 1.5% if the Fe_2O_3 content is below 0.5%, in an amount of from 1.05 to not over 1.75% if the Fe_2O_3 content is 0.5 to 2.5%, in an amount of from 1.3 to at most 2.0% if the Fe_2O_3 content is above 2.5 to 4.5%, and in an amount of from 1.8 to not more than 2.5% if the Fe_2O_3 is above 4.5%.

4,049,462

CHEMICAL FIXATION OF DESULFURIZATION RESIDUES

Eugene P. Cocozza, Washingtonville, N.Y., assignor to Wehran Engineering Corporation, Middletown, N.Y.

Filed Feb. 12, 1976, Ser. No. 657,424
Int. Cl.² C04B 1/00
U.S. Cl. 106—85 35 Claims

1. Method for the chemical fixation of industrial desulfurization residues containing calcium and sulfur which result from the sulfur constituent removal treatment of gaseous effluent of basic manufacturing processes which comprises:

admixing said desulfurization residues with an alkaline argillaceous and calcarious calcination stack dust and adjusting the pH of the resulting admixture with an inorganic acid to a value in the acid pH range below 7 in the presence of sufficient water to provide a mass of workable consistency, and;

drying the pH adjusted mass to constant weight to produce an enviornmentally stable and leach resistant hardened solid product.

4,049,463

METHOD FOR PRODUCING A PURE CERIUM OXIDE

Leo Hafner, Althofen, Austria, assignor to Treibacher Chemische Werke Aktiengesellschaft, Treibach, Austria

Filed July 21, 1976, Ser. No. 707,381
Claims priority, application Austria, July 25, 1975, 5803/75
Int. Cl.² C09C 1/00
U.S. Cl. 106—288 B 8 Claims

1. A method of improving the brightness of a cerium oxide, comprising the steps of adding a boron compound to a cerium salt or a mixture of cerium salts selected from the group consisting of cerium oxalate, cerium carbonate and cerium oxide hydrate, and then calcining the mixture in the presence of air, the boron compound being capable of producing B_2O_3 on calcining and being added in an amount to provide, calculated as B_2O_3, 0.05% to 5%, by weight, of the boron compound, based on the weight of cerium oxide.

4,049,464

METHOD OF PRODUCING LOW-CARBON, WHITE HUSK ASH

Alexander Tutsek, Gottingen, and Peter Bartha, Bovenden, both of Germany, assignors to Refratechnik GmbH, Gottingen, Germany

Continuation of Ser. No. 562,098, March 26, 1975, abandoned. This application Sept. 2, 1976, Ser. No. 720,089
Claims priority, application Germany, Apr. 4, 1974, 2416291
Int. Cl.² C04B 31/00
U.S. Cl. 106—288 B 7 Claims

1. In a method of producing low-carbon, white rice husk ash suitable for the production of building materials, and more particularly refractory building materials, in which method, for purposes of removing volatile constituents and for purposes of transforming the fixed carbon into a gaseous compound, the rice husks are heated to a temperature below the crystallization temperature of the SiO_2 of the rice husks, whereupon the resultant husk ash is heat-treated at a temperature above the crystallization temperature of the SiO_2 for the purposes of obtaining a uniform SiO_2 crystal structure, the improvement comprising: the first step of heating the rice husks to a first relatively low separation temperature within the range of from 200° to 450° C. in the absence of air, exclusively for separating the volatile constituents that are capable of after-burning; subsequently the second step of heating the rice husks free of volatile constituents to a gasification temperature in the range of from 450° to 550° C. while feeding an oxidizing agent thereto for transforming the fixed carbon into a gaseous phase prior to heat treatment; and the third step of subsequently heating the thus obtained rice husk ash to a heat treatment temperature in the range of from 700° to 800° C.

4,049,465

CONCRETE ADDITIVE AND METHOD OF APPLYING STUCCO CEMENT

Richard E. Dwyer, 173 Adams St., Dedham, Mass. 02026

Filed Apr. 5, 1976, Ser. No. 673,474
Int. Cl.² C04B 7/351, 13/26
U.S. Cl. 106—314 6 Claims

1. A concrete additive comprising, by dry volume approximately,

four parts protein, and

one part calcium cyanamide.

4,049,466

LEVULOSE CONTAINING SWEETENING COMPOSITIONS

Raoul Guillaume Phillipe Walon, Brussels, Belgium, assignor to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 303,581, Nov. 3, 1972, abandoned, which is a continuation of Ser. No. 42,587, June 1, 1970, abandoned. This application Jan. 21, 1974, Ser. No. 435,388
Int. Cl.² C13K 11/00
U.S. Cl. 127—29 10 Claims

1. A solid sweetening composition comprising from about 10 to about 50 weight percent levulose and from about 50 to about 70 weight percent of a starch hydrolysate having a high degree of water solubility, having a dextrose equivalent between about 1 and about 25 and a polysaccharide content, having a degree of polymerization greater than 4, of at least about 60 weight percent, provided the polysaccharide content of the total composition having a degree of polymerization greater than 4 is at least about 40 weight percent.

4,049,467

METHOD AND COMPOSITIONS FOR REMOVAL OF HARD SURFACE MANGANESE ION-DERIVED DISCOLORATIONS

Fred Kurt Rubin, Leonia, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,521
Int. Cl.² B08B 3/08; C02B 5/06
U.S. Cl. 134—2 26 Claims

1. A method for removing manganese ion-derived discolorations from hard surfaces comprising:

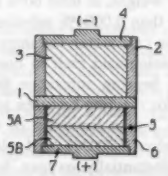
treating said discolored hard surfaces, in the presence of water, with a sufficient amount to remove said discoloration of a hydroxy compound selected from the group consisting of dihydroxy maleic acid, dihydroxy tartaric acid, the alkali metal salts of said acids, and mixtures thereof.

4,049,468

SOLID ELECTROLYTE CELL

Yuzuru Ito, Sendai, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jan. 29, 1975, Ser. No. 545,222
Claims priority, application Japan, Nov. 16, 1973, 48-129014
Int. Cl.² H01M 13/00
U.S. Cl. 429—193 6 Claims



1. A solid electrolyte cell comprising, and anodic-active

material, a cathodic-active material and a solid β-alumina electrolyte juxtaposed therebetween and in contact therewith, wherein said cathodic-active material is a compound of the class having water of crystallization included therein.

4,049,469

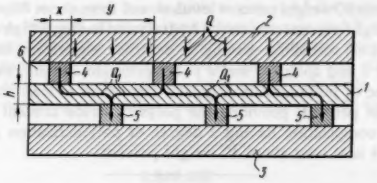
FILM THERMOELEMENT

Nikolai Vasilievich Kolomoets, ulitsa Kastanaevskaya 61, kv. 22; Zinovy Moiseevich Dashevsky, ulitsa Marxa-Engelsa 15, kv. 52; Vladimir Isaakovich Granovsky, ulitsa Bazhova 15, korpus 1, kv. 84; Igor Aronovich Shmidt, Leningradsky prospekt 24, kv. 41, and David Mendelevich Gelfgat, ulitsa Nagornaya 49, korpus 18, kv. 58, all of Moscow, U.S.S.R.

Continuation of Ser. No. 588,780, June 20, 1975, abandoned. This application July 6, 1976, Ser. No. 702,618

Int. Cl.² H01L *35/04*

U.S. Cl. 136—225 **2 Claims**



1. A film thermoelement comprising: branches; a film of a semiconductor material in each said branch; a plurality of contact strips applied onto one side of said film and forming gaps therebetween; another plurality of contact strips applied onto the other side of said film and forming gaps therebetween said another plurality of contact strips being displaced with respect to said first plurality of contact strips; a hot thermal bus in direct contact with said first plurality of contact strips; and a cold thermal bus in direct contact with said other plurality of contact strips.

4,049,470

REFINING NICKEL BASE SUPERALLOYS

Claudia J. Burton, Clinton, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,297

Int. Cl.² C22F *1/10*

U.S. Cl. 148—3 **6 Claims**

1. In a process for producing a low iron, nickel base superalloy, which process includes the steps of preparing a superalloy melt containing, by weight, at least 60% nickel, no more than 1% iron, and more than 0.0004% selenium; casting said melt; and heat treating the cast metal; the improvement comprising the steps of maintaining said melt in contact with a calcium and/or magnesium bearing substance for a period of time sufficient to allow for reaction between selenium, and calcium and/or magnesium, and a lowering of said melt's selenium content to a level below 0.0003%, said selenium removal being carried out in a substantially oxygen free atmosphere, said reacted selenium accumulating as slag on the surface of said melt, said selenium-bearing slag being separated from said melt prior to solidification of said melt.

4,049,471

TECHNIQUE FOR STABILIZING CONTACT RESISTANCE OF GOLD PLATED ELECTRICAL CONTACTS

Donald Eldridge Koontz, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 26, 1976, Ser. No. 708,553

Int. Cl.² C22F *1/14*

U.S. Cl. 148—13 **5 Claims**

1. Technique for stabilizing the resistance of gold plated electrical contacts which comprises immersing the contact in a boiling oxidizing agent for a time period ranging from 1–3 minutes, the reduction products of the oxidizing agent being water soluble at elevated temperatures.

2. Technique in accordance with claim **1** wherein stabilization is effected prior to thermal aging.

4,049,472

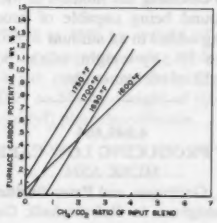
ATMOSPHERE COMPOSITIONS AND METHODS OF USING SAME FOR SURFACE TREATING FERROUS METALS

Edward J. Arndt, Lenhartsville, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 22, 1975, Ser. No. 643,348

Int. Cl.² C21D *1/48*; B23K *35/34*; C01B *2/00*

U.S. Cl. 148—16 **19 Claims**



1. A gaseous mixture prepared at ambient temperature suitable for injecting into a ferrous metal treating furnace maintained at a temperature in excess of 1500° F wherein ferrous metal parts are heated in a furnace atmosphere created by the gas mixture injected into the furnace, the atmosphere being variable to perform a treatment selected from the group consisting of carburizing, decarburizing, neutral hardening and carbonitriding, said mixture consisting essentially of 62 to 98% by volume substantially pure nitrogen;

1.5 to 30% by volume natural gas being substantially methane;

0.2 to 15% by volume substantially pure carbon dioxide;

the natural gas and carbon dioxide being present in a ratio of 0.5 to 15.0 natural gas/carbon dioxide; and

0.0 to 10% by volume substantially pure ammonia.

4,049,473

METHODS FOR CARBURIZING STEEL PARTS

Raymond L. Davis, II, Newtown Square, Pa., and Robert I. Beck, Somerset, N.J., assignors to Airco, Inc., Montvale, N.J.

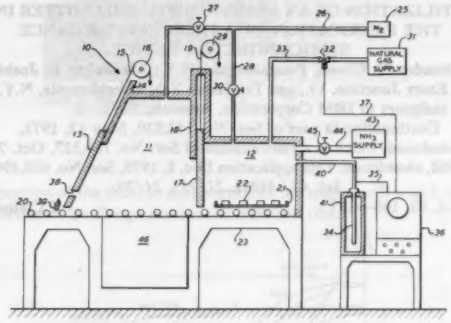
Filed Mar. 11, 1976, Ser. No. 665,844

Int. Cl.² C21D *1/48*

U.S. Cl. 148—16.5 **14 Claims**

1. A method of carburizing steel workpieces in the work

chamber of a vestibule furnace while avoiding explosion hazards without the use of a carrier gas such as endothermic or purified exothermic gas, comprising the steps of heating said work chamber to a temperature of at least 1350° F, introducing an inert gas into the vestibule of said furnace at a flow rate of less than 50% of the carrier gas flow rate recommended for said furnace to maintain the oxygen content in the vestibule below levels at which combustion is supported while supplying a gaseous carbon source to said work chamber without a



carrier gas for carburizing said workpieces without utilization of a carrier gas for said carbon source with the inert gas in said vestibule being effective to increase the residence time of said gaseous carbon source in said work chamber such that a substantial reduction in the consumption of said gaseous carbon source required for carburizing atmospheres is obtained as compared to the consumption of said gaseous carbon source required for carburizing atmospheres when said carrier gas is utilized in carburizing said workpieces.

4,049,474

ALUMINUM-BASED ALLOY

Evegny Dmitrievich Zakharov, Elokhovsky proezd, 5/50, kv. 4a, Moscow; Gennady Lvovich Shneider, ulitsa Marshala Birjuzova, 28, kv. 145, Odintsovo Moskovskoi oblasti; Viktor Dmitrievich Valkov, ulitsa Srednyaya Pervomaiskaya, 19, kv. 145, Moscow; Viktor Pavlovich Kapitonov, ulitsa Marshala Birjuzova, 40, kv. 90, Moscow; Petr Grigorievich Miklyaev, Bobruiskaya ulitsa, 18, korpus 1, kv. 50, Moscow; Vladimir Alexandrovich Lebedev, ulitsa Gamaleya, 2, kv. 41, Moscow; Vera Ivanovna Kholnova, ulitsa Gorkogo, 40, kv. 13, Moscow; Stanislav Alexeevich Shesterikov, Frunzenskaya naberezhnaya, 26, kv. 55, Moscow, and Vasily Mikhailovich Bobrovsky, ulitsa Nedelina, 8, kv. 49, Moscow, all of U.S.S.R.

Filed July 25, 1975, Ser. No. 599,131

Int. Cl.² C22C *21/10*

U.S. Cl. 148—32.5 **2 Claims**

1. A bulky aluminum-based alloy product having high strength and plasticity in short transverse direction and relatively low internal stress, the alloy consisting essentially of, measured as weight percent:

zinc: 6.5 – 7.6;

magnesium: 1.6 – 2.2;

copper: 0.8 – 1.2;

cobalt: 0.05 – 0.2;

zirconium: 0.05 – 0.3; and

the balance comprising aluminum and up to 0.3 weight percent iron, up to 0.3 weight percent silicon, up to 0.05 weight percent chromium, and up to 0.05 weight percent manganese, the bulky product having been subjected to solution treatment with cooling and hardening in boiling water.

4,049,475

$SECo_5$-PERMANENT MAGNET JOINED TO AT LEAST ONE IRON MASS AND METHOD OF FABRICATING SUCH A PERMANENT MAGNET

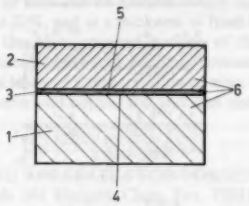
Jaroslaw Houska, Niederrohrdorf, Switzerland, assignor to BBC Brown Boveri & Company, Limited, Baden, Switzerland

Filed May 11, 1976, Ser. No. 685,260

Claims priority, application Switzerland, May 22, 1975, 6571/75

Int. Cl.² H01F *1/02*

U.S. Cl. 148—101 **5 Claims**



1. An $SECo_5$-permanent magnet composite of said permanent magnet bonded to at least one piece of iron wherein there is provided between said permanent magnet and the iron piece a metallic intermediate layer comprising Cu, Ag, Au or alloys thereof, or an alloy selected from the group consisting of: Cu Au (70/30), Cu Au Ni (62/35/3), Cu Au (62.5/37.5), Cu Ag (95/5), Au Ni (82/18), Cu Sn Ag (85/8/7), Cu Au Ag (55/42/3), Au Cu Ag (58/40/2), Cu Ag (60/40), Au Cu Ag (75/20/5), Au Cu (81.5/18.5), Pt Sn (70/30), Ni FeP (56/33/11), Ti Ni (70/30), Cu Si (97/3), Cu Mg (85/15), Ni P (89/11), Cu Ti (76/24), Cu Zn (60/40), Cu Zn Sn (59/39/2), Cu Zn (42/58), Cu Zn (54/46), Ag Cu Zn (5/55/40), Ag Cu Zn (12/48/40), Ag Cu Cd Zn (12/50/5/33), Ag Cu Zn (20/44/36) or mixtures thereof, wherein the numbers in parenthesis refer to the proportions by weight of the respective alloy components and having a thickness equal to or less than 50 μm which is hard-soldered to both the permanent magnet and the iron piece, and wherein SE is an element having an atomic number of 58–71 or mixtures thereof.

4,049,476

METHOD OF MANUFACTURING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WHICH INCLUDES AT LEAST ONE V-GROOVE JFET AND ONE BIPOLAR TRANSISTOR

Noboru Horie, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Sept. 29, 1975, Ser. No. 617,641

Claims priority, application Japan, Oct. 4, 1974, 49-113854

Int. Cl.² H01L *21/22, 21/306, 29/76*

U.S. Cl. 148—175 **4 Claims**

1. A method of manufacturing a semiconductor integrated circuit device which includes at least one junction field-effect transistor and at least one bipolar transistor, comprising the steps of:

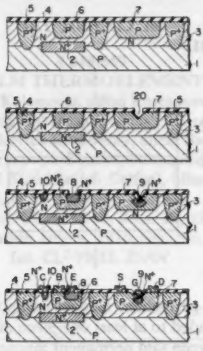
a. preparing a semiconductor substrate, having one principal surface with a plurality of isolated regions of a first conductivity type, extending thereinto from the one principal surface;

b. simultaneously diffusing an impurity of a second conductivity type, opposite said first conductivity type, from said one principal surface into one of said isolated regions and into another of said isolated regions in order to form a first semiconductor region for a base region of said bipolar transistor in the one isolated region and to form a second semiconductor region for a channel region of said junction field-effect transistor in the other isolated region, thereby forming said first and second semiconductor regions having the same depth;

c. etching a selected part of said second semiconductor

region in order to form a groove within said second semiconductor region; and

d. diffusing an impurity of said first conductivity type simultaneously from said one principal surface into a selected part of said first semiconductor region and into a selected part of said second semiconductor region including the groove portion in order to form a third semiconductor



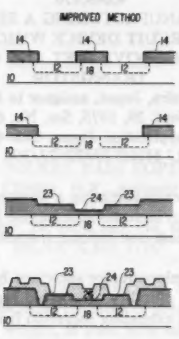
region for an emitter region of said bipolar transistor within said first semiconductor region and to form a fourth semiconductor region for a gate region of said junction field-effect transistor within said second semiconductor region, thereby forming said fourth semiconductor region for the gate region deeper than said third semiconductor region for the emitter region from said one principal surface of the semiconductor substrate.

4,049,477

METHOD FOR FABRICATING A SELF-ALIGNED METAL OXIDE FIELD EFFECT TRANSISTOR

Thomas R. Ligon, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 2, 1976, Ser. No. 663,170
Int. Cl.² H01L *21/22*
U.S. Cl. 148—187 **8 Claims**



1. A method for fabricating a metal oxide semiconductor field effect transistor, the method comprising:

diffusing a phosphorous dopant into both a drain region and a source region of a silicon semiconductor substrate to produce a selected concentration of phosphorous in the drain and source regions;

exposing a channel region of the silicon semiconductor substrate and simultaneously exposing the drain and source regions to an oxidizing medium at a temperature less than 1000° C. to form an oxide layer over the channel region;

forming a gate electrode contacting the oxide layer over said channel region; and

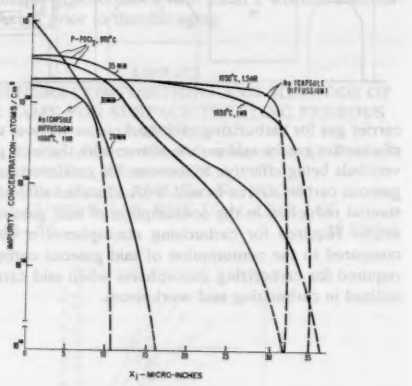
forming openings through the oxide layer to attach electrodes to the drain and source regions.

4,049,478

UTILIZATION OF AN ARSENIC DIFFUSED EMITTER IN THE FABRICATION OF A HIGH PERFORMANCE SEMICONDUCTOR DEVICE

Hitendra N. Ghosh, Poughkeepsie, N.Y.; Madhukar L. Joshi, Essex Junction, Vt., and Tsu-Hsing Yeh, Poughkeepsie, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 142,820, May 12, 1971, abandoned, which is a continuation of Ser. No. 765,327, Oct. 7, 1968, abandoned. This application Dec. 8, 1975, Ser. No. 638,496
Int. Cl.² H01L *21/223, 21/20*
U.S. Cl. 148—187 **4 Claims**



1. The mehtod of forming a high performance PN semiconductor device comprising:

introducing a P-type impurity into a silicon semi-conductor body so as to provide a surface concentration level of greater than about 10^{19} atoms per cm^3;

diffusing arsenic within said P-type region so as to provide a surface concentration level of arsenic of greater than about 10^{20} per cm^3;

continuing said diffusion step until said arsenic forms a substantially square impurity distribution.

4,049,479

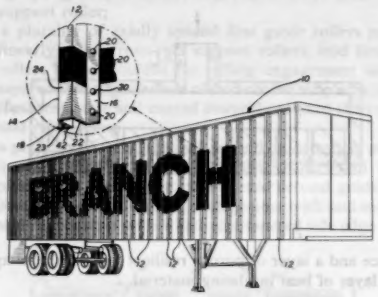
METHOD OF INSTALLING DECALS ON VERTICALLY RIBBED TRAILER BODIES

Stephen J. Siker, 39 Park Ave., Randolph, N.J. 07801

Filed Feb. 28, 1977, Ser. No. 773,056
Int. Cl.² G09F *7/16*
U.S. Cl. 156—71 **3 Claims**

1. Method of applying graphics to a ribbed wall of a trailer body comprising, positioning an undistorted flexible sheet bearing said graphics in a selected location relative to said trailer wall and fixing said flexible sheet in said location by securing a portion of the same to the outer surface of a trailer rib, cutting said sheet to provide a portion which is folded over and affixed to a side wall of said rib, folding over and affixing to another rib side wall another portion of said sheet, cutting

said sheet to provide a separate intermediate portion free of the sheet portion affixed to said rib, and securing the intermediate



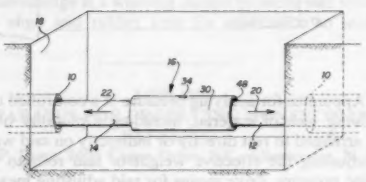
portion of the sheet to that portion of the trailer wall which lies between the flange portions of adjacent ribs.

4,049,480

METHOD AND APPARATUS FOR FORMING A JOINT IN A CONFINED SPACE BETWEEN TWO ABUTTING ENDS OF CONDUIT LINERS

C. T. Kutschke, Dallas, Tex., assignor to Nipak, Inc., Dallas, Tex.

Filed Oct. 10, 1975, Ser. No. 621,406
Int. Cl.[2] B32B *35/00*
U.S. Cl. 156—94 11 Claims



1. A method of relining a buried conduit comprising:
excavating to provide access to the conduit;
opening the conduit at the excavation to provide access to the interior of the conduit in two directions;
inserting separate sections of conduit liner through the opening and into the conduit in opposite directions until the ends of the two sections are abutting to thereby reline the conduit;
positioning a cylindrical sleeve with a port through its wall at a point intermediate the ends of said sleeve onto the end of one of said sections;
positioning the ends of said sections in a coaxial abutting arrangement;
overlapping the ends of the sections with adhesive tape to connect the ends of the sections together;
moving the sleeve to a position overlapping the ends of the sections;
connecting the ends of the sleeve to the exterior of the conduit sections by wrapping adhesive tape around the sleeve ends to seal the annular space between the interior of the sleeve and the exterior of the conduit sections;
injecting settable polyurethane foam through the port in the sleeve to fill the annular space between the interior of the sleeve and the exterior of the conduit sections; and
allowing the polyurethane foam to set.

4,049,481

SURFACE TREATMENT METHOD OF COPPERFOIL

Shigeyoshi Morisaki, Ageo, Japan, assignor to Mitsui-Anaconda Electro Copper Sheet Co. Ltd., Tokyo, Japan

Filed June 16, 1976, Ser. No. 696,624
Claims priority, application Japan, Dec. 17, 1975, 50-150365
Int. Cl.[2] C25D *3/22, 3/30*
U.S. Cl. 156—151 5 Claims

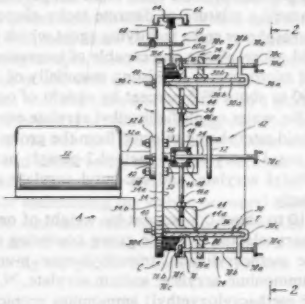
1. A method for surface treatment of copper foil used for printed circuit boards comprising the steps of subjecting a nodularized surface of copper foil to electrodeposition thereon of a thin layer of zinc and tin alloy in which the tin content is from about 5 to 20%, and at a thickness of from 0.03μ to 0.15μ, and adhering the alloy-covered surface of the nodularized copper foil thus obtained to a resinous laminate by heat and pressure until a layer of a ternary alloy of zinc, tin and copper is formed between said copper foil and said resinous laminate.

4,049,482

METHOD AND APPARATUS FOR FORMING FLANGES

James W. Webb, 301 Hargett, Clute, Tex. 77531

Filed Feb. 27, 1976, Ser. No. 662,261
Int. Cl.[2] B65H *81/00*
U.S. Cl. 156—172 7 Claims



1. A method for forming flanges of fiberglass reinforced plastic on a tubular member, comprising the steps of:
soaking at least one fiberglass strand with a resin;
mounting the tubular member with a face plate;
rotating the face plate having the tubular member therewith;
directing the resin soaked fiberglass strand to the rotating tubular member;
winding the resin soaked fiberglass strand on the tubular member while the tubular member is rotated to form a plurality of layers;
laterally distributing the resin soaked fiberglass strand on the tubular member between the face plate and an adjustable guide member assembly mounted with the face plate and disposed about the tubular member for forming an annular flange of a predetermined axial cross-sectional width; and
compacting the fiberglass strand on the tubular member by moving a distribution header laterally of the tubular member for providing substantially uniform compacting of the strands and substantially uniform axial cross-sectional height of the flange.

4. An apparatus for forming an annular flange of fiberglass reinforced plastic on a tubular member, comprising:
means for soaking at least one fiberglass strand with a resin;
a face plate for mounting the tubular member therewith;
means for rotating said face plate having the tubular member therewith
a guide member adapted to be positioned about the tubular member and mounted with said face plate;
distribution means with said rotating means for distributing said resin soaked fiberglass strand between said face plate

and said guide member on the tubular member, said distribution means permitting winding and lateral distribution of said resin soaked fiberglass strand on the tubular member while the tubular member is rotated by said rotating means to form an annular flange of a plurality of layers having a predetermined axial cross-sectional width; and

compacting means for compacting said layers of resin soaked fiberglass strands to prevent undesired voids being formed in said plural layers as well as to promote uniform packing density of said fiberglass strand for the annular flange, said compacting means being integral with said distribution means.

4,049,483

PRESSURE SENSITIVE HOT-MELT ADHESIVE SYSTEM

Harry A. Loder, Woodbury, and Charles A. Mathna, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 18, 1976, Ser. No. 742,743

Int. Cl.² B32B *27/06*

U.S. Cl. 156—230 **9 Claims**

5. A hot melt adhesive system having pressure sensitive adhesion at ordinary room temperature conditions which is capable of forming a permanent bond at elevated temperatures comprising a heat-activatable adhesive capable of forming a substantially permanent bond at elevated temperatures having dispersed therein a mixture of discrete tacky elastomeric copolymer microspheres and a tackifying agent which is compatible with said microspheres and capable of increasing the tack thereof, said microspheres consisting essentially of

a. about 90 to about 99.5 percent by weight of one or more oleophilic, water-emulsifiable alkyl acrylate esters, at least one of said esters being selected from the group consisting of iso-octyl acrylate, 4-methyl-2-pentyl acrylate, 2-methylbutyl acrylate, and sec-butyl acrylate and correspondingly

b. about 10 to about 0.5 percent by weight of one or more monomers selected from the group consisting of trimethylamine methacrylimide, trimethylamine p-vinyl benzimide, ammonium acrylate, sodium acrylate, N,N-dimethyl-N-(β-methacryloxyethyl) ammonium propionate betaine, 1,1-dimethyl-1-(2-hydroxypropyl) amine methacrylimide, 4,4,9-trimethyl-4-azonia-7-oxo-8-oxa-9-decene-1-sulphonate, 1,1-dimethyl-1-(2,3-dihydroxypropyl) amine methacrylimide, and maleic anhydride.

9. A process comprising the steps of

a. applying an adhesive coating to a release-coated sheet material, said adhesive coating comprising the adhesive system of claim **5** wherein at least a portion of said microspheres are present at the surface of said adhesive coating;

b. placing an object on the surface of the adhesive coating and burnishing;

c. removing said object, whereby said adhesive coating is transferred to said object;

d. positioning said object on a substrate; and

e. heating said adhesive system to the heat-activation temperature thereof, whereby a substantially permanent bond is effected between said object and said substrate.

4,049,484

VACUUM TRANSFER HEAD AND METHOD OF USE

John Garrick Priest, and Robert Barry Tooth, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

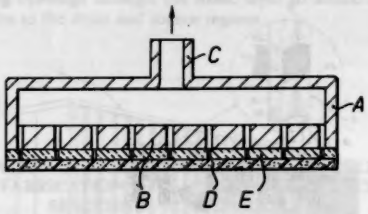
Filed Sept. 8, 1975, Ser. No. 611,245

Claims priority, application United Kingdom, Sept. 13, 1974, 40022/74

Int. Cl.² B29C *17/00*; B25B *11/00*; A47B *97/00*

U.S. Cl. 156—285 **6 Claims**

1. A vacuum head for handling transfers comprising a hollow body having a perforate or porous face, a pipe connection for connecting the hollow body to a source of suction, a layer of perforate or porous heat insulating material applied to the



said face and a layer of porous resilient foam material applied to the layer of heat insulating material.

4,049,485

CORRUGATING MACHINERY

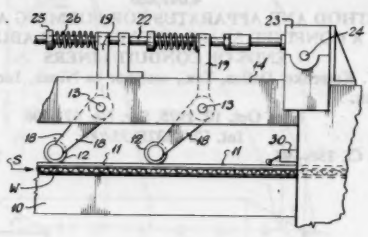
Bjorn Iversen, Wilmslow, England, assignor to Simon Container Machinery Limited, Stockport, England

Filed Feb. 23, 1976, Ser. No. 660,633

Claims priority, application United Kingdom, Mar. 8, 1975, 9742/75

Int. Cl.² B31B *31/00*

U.S. Cl. 156—351 **9 Claims**



1. Apparatus for applying pressure in a controlled manner to a moving web of material, including a plurality of pressure rolls arranged to rest directly or indirectly on said web, means for adjusting the effective weight of said rolls to vary said applied pressure, drive means for said adjusting means, means for sensing the pressure applied by said rolls and providing a signal corresponding to said pressure, means for sensing the speed of movement of said web and providing a signal corresponding to said speed, means for continually comparing said signals from said pressure and speed sensing means and for automatically actuating said drive means accordingly thus to cause the effective weight of said rolls to vary as the speed of the web varies, means for varying the rate at which said effective weight may vary, and means for preselecting an initial positive or negative constant factor of said effective weight.

4,049,486

RUBBER STRIP GUIDE APPARATUS

Virgil E. Henley, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Oct. 15, 1975, Ser. No. 622,577

Int. Cl.² B29H *17/20, 17/36*

U.S. Cl. 156—405 R **21 Claims**

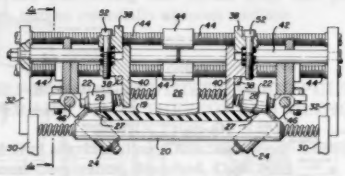
1. Apparatus suitable for guiding into precise alignment with a tire carcass an uncured, deformable semiplastic rubber strip having at least one tapered side edge surface meeting to form a skived or feathered edge with the upper or lower surface of said strip, examples of said rubber strip being a tire tread strip and a tire sidewall strip, said apparatus comprising:

a. a plurality of support rollers mounted in axially spaced apart and parallel relation for supporting the lower sur-

face of said rubber strip with each support roller being axially movable and resiliently held in the axial direction by springs mounted in compression at the ends of each support roller;

b. a plurality of axially spaced first guide rollers mounted linearly offset from said support rollers, said first guide rollers being mounted for rolling engagement with said tapered side edge surface of said rubber strip adjacent said feathered edge and canted inwardly toward the center of said rubber strip;

c. a plurality of axially spaced second guide rollers mounted linearly offset from the first guide rollers and linearly offset from the support rollers, said second guide rollers being mounted for rolling engagement with said surface of said rubber strip with which said tapered side edge surface



meets to form said feathered edge, said second guide rollers being canted inwardly toward the center of said rubber strip;

d. means for limiting the outward movement of the edge of said rubber strip laterally opposite from said feathered edge;

e. said support rollers being adapted to move axially to accommodate any transverse movement of said rubber strip;

said linearly offset first and second guide rollers thereby limiting the outward movement of said feathered edge of said rubber strip and combining with said support rollers to channel said feathered edge in a weaving motion between said rollers to properly align said rubber strip for application to said tire carcass.

4,049,487

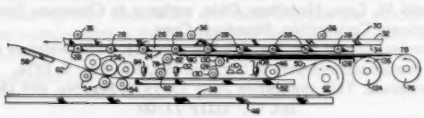
APPARATUS FOR PRODUCING HONEYCOMB PANELING

Bernard P. Kunz, 1609 Cague Drive, NE., Albquerque, N. Mex. 87110

Continuation of Ser. No. 391,678, Aug. 27, 1973, abandoned, which is a continuation-in-part of Ser. No. 166,818, July 28, 1971, abandoned. This application July 21, 1975, Ser. No. 597,409

Int. Cl.[2] B31D *3/02*

U.S. Cl. 156—436 **1 Claim**



1. Apparatus for producing honeycomb paneling from a continuous length of pre-formed, rigid honeycomb core having open cells therein whose edges form the major faces thereof by applying facing material in its raw state, as a non-rigid web of felted mat material made from glass fibers, to at least the top major face of the core and processing the facing material to its finished state by curing in said apparatus to form a panel skin which is embedded into the core edges, said apparatus comprising:

an elongate, rigid support platen having a planar upper surface and extending generally horizontally from a first upstream end to a second downstream end, the length of said platen generally defining a laminating zone with an entrance station adjacent to the upstream end of said platen and an exit station adjacent to the downstream end;

a honeycomb core transfer unit located upstream of said platen and substantially coplanar therewith and adapted to continuously deliver core material to the laminating zone;

an endless loop belt overlying said platen and trained about upstream and downstream support rollers adjacent to the entrance and exit stations and having an upper pass and a lower pass, said lower pass spaced above and parallel to the platen upper surface;

means to carry and furnish a continuous web of the raw felted facing material to the surface of the upper pass of said belt;

an applicator to deposit liquid resin on the web while it is on the upper pass of the belt;

drive means to cause continuous travel of the core to the entrance station and through the laminating zone and continuous travel of the belt to carry the web around the upstream support roller and along the lower pass thereof into laminating contact with the upper major face of the core while the web is still in its raw state;

means to supply a continuous strip of open mesh woven fabric under tension directly to the side of said web on said belt which is to come into contact with said core adjacent said upstream support roller without said fabric first contacting said upper pass of said belt, said supply means including a reel on a shaft for supporting said fabric and brake means operatively connected to said shaft for applying a frictional force to said shaft to maintain tension on said strip of open mesh woven fabric, to support the lower surface of the web in a planar condition as it comes into contact with the core and to hold it in a planar condition until it is cured in said laminating zone to minimize sagging of the web into the open cells to form an upper panel skin, said fabric being sandwiched between said core and web after lamination; and

means for maintaining the web in pressural contact with the core to cause the web to be imbedded in the edge of the core cells to bond the web and core into a unitary assembly during the period of curing of the web.

4,049,488

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

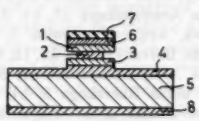
Rudolf Paulus Tijburg, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1976, Ser. No. 675,178

Claims priority, application Netherlands, May 1, 1975, 7505134

Int. Cl.[2] H01L *21/312*

U.S. Cl. 156—655 **15 Claims**



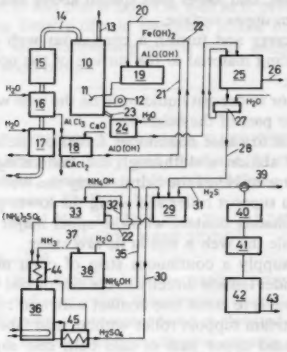
1. A method of manufacturing a semiconductor device having a semiconductor body of $A^{III}B^{V}$ semiconductor material and comprising two adjoining regions of different compositions, one of the regions being etched selectively relative to the other region in a solution of an oxidizing material in water, comprising the steps of providing an etching solution consisting of said oxidizing material and a reducing material which forms a redox system with said oxidizing material, the concentrations of said oxidizing and reducing materials, as well as the pH of the solution, being chosen to be such that the ratio of the relative etching rates of said regions is at least 10:1, and etching said body with said etching solution.

4,049,489

METHOD OF PRODUCING PULP AND BURNING WASTE LIQUOR OBTAINED THEREBY

Anders Vegeby, 1230 NW. 121st St., Seattle, Wash. 98177

Filed Mar. 15, 1976, Ser. No. 666,687
Claims priority, application Sweden, Mar. 19, 1975, 7503106
Int. Cl.[2] D21C 11/12, 11/04
U.S. Cl. 162—30 R 6 Claims



1. In a process for producing pulp, in which a cellulose feed stock is cooked in an aqueous liquor containing sulphur, and the resulting waste liquor is burnt in a furnace in order to recover chemicals which are used for preparing cooking liquor to be recycled in the process, the steps of:

a. introducing an iron compound into the furnace, together with, or in parallel to the waste liquor;

b. reacting said iron compound within the furnace with the sulphur constituent in the burning waste liquor to form a smelt containing an insoluble iron sulphide;

c. removing said smelt from the furnace and dissolving said smelt in an aqueous solution to form a weak liquor for recycling in the process;

d. separating said insoluble sulphide from said solution;

e. reacting said separated iron sulfide with sulphuric acid to produce $FeSO_4$ and H_2S, and separating said $FeSO_4$ and H_2S; and reacting the $FeSO_4$ with NH_4OH to obtain ammonium sulfate, $(NH_4)_2SO_4$, and iron hydroxide, $Fe(OH)_2$, and recycling the latter as the iron compound to be introduced into the furnace.

4,049,490

ELECTRODIALYSIS OF BLEACHING EFFLUENT

Veniamin Petrovich Zaplatin, ulitsa Tupoleva 20a, kv. 34; Vasily Petrovich Svitelsky, ulitsa Voroshilova 20, kv. 104; Lev Ivanovich Galov, ulitsa Armyanskaya 27, kv. 31; Alla Konstantinovna Djukareva, Artillerii pereulok 3, kv. 22; Rozalia Grigorievna Sklyar, Bulvar Lepse 7, kv. 11; Vasily Alexeevich Denisovich, ulitsa Armyanskaya 27, kv. 30; Dmitry Alexeevich Shirokov, ulitsa Raevskogo 5, kv. 2, and Vladimir Alexandrovich Shevchenko, ulitsa Armyanskaya 27, kv. 4, all of Kiev, U.S.S.R.

Filed Feb. 23, 1976, Ser. No. 660,496
Int. Cl.[2] D21C 9/12, 11/00
U.S. Cl. 162—37 3 Claims

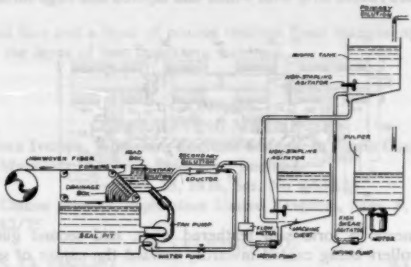
1. In a process for bleaching a cellulose-containing vegetable material which comprises the steps of chlorinating cellulosic material in a chlorination zone followed by ammonia treatment and post bleaching with washing stages between said steps, the improvement which comprises purifying waste waters resulting from said washing stages by subjecting said waste waters to electrodialysis and recovering ammonium chloride from the purified waste waters, treating said cellulosic material with said ammonium chloride prior to the chlorination step and re-using the purified waste waters in the wash stages thereby providing a closed cycle system and eliminating the drainage of polluted wash waters to natural water sources.

4,049,491

VISCOUS DISPERSION FOR FORMING WET-LAID, NON-WOVEN FABRICS

Ralph E. Brandon, Monroe; Charles J. Davis, Goshen; Michael Ring, Warwick, and Roy S. Swenson, Central Valley, all of N.Y., assignors to International Paper Company, New York, N.Y.

Filed Feb. 20, 1975, Ser. No. 551,399
Int. Cl.[2] D21D 3/00
U.S. Cl. 162—101 4 Claims



1. In a process for diluting a stable, viscous, uniform, air, fiber and water dispersion, which contains about 1% to 10% by volume of entrained air and about 0.03% to 1.0% by weight of staple length fibers, at least about 10% by weight of the fibers having a length to diameter ratio of about 400 to 3000, and which has a nascent viscosity of about 10 to 125 cps., when measured at a shear rate of 30.5 $sec.^{-1}$; with a viscous aqueous diluting medium, which contains about 1% to 10% by volume of entrained air and which has a nascent viscosity of about 5 to 30 cps., when measured at shear rate of 30.5 $sec.^{-1}$; the improvement which comprises:

feeding about one volume of the air, fiber, and water dispersion to the annulus ring of an eductor and feeding about two to twelve volumes of the diluting medium to the center feed of the eductor, just upstream of the vena contracta thereof, whereby the air, fiber and water dispersion is uniformly mixed with and distributed throughout the diluting medium, without undue entangling of the fibers.

4,049,492

SELF-BONDING SYNTHETIC WOOD PULP AND PAPER-LIKE FILMS THEREOF AND METHOD FOR PRODUCTION OF SAME

Donald W. Lare, Hamilton, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 603,328, Aug. 11, 1975, which is a continuation-in-part of Ser. No. 496,095, Aug. 9, 1974, abandoned. This application June 23, 1976, Ser. No. 699,186
Int. Cl.[2] D21F 11/00
U.S. Cl. 162—146 9 Claims

1. A method for producing synthetic wood pulp comprising refining solid polyolefin fiber in a low molecular weight organic liquid dispersant, miscible both with liquid hydrocarbon and water, under conditions of high shear stress for a period of time sufficient to produce fibrids characterized by having the combination of both film and fiber morphology, then treating said fibrids with a preservative medium comprising a water-soluble surface active agent having hydrophilic properties under conditions of high shear stress sufficient substantially to displace said dispersant and to preserve the film and fiber morphology of said fibrids and transferring said fibrids from said preservative medium into an essentially aqueous medium.

7. In a method for the formation of synthetic paper-like

structures comprising forming and then drying a film of an aqueous slurry of polyolefin fibrid, the improvement in which said fibrid comprises partially unfurled fibrids of polyolefin characterized by the combination of both film and fiber morphology said fibrids are produced by refining solid polyolefin fiber in a low molecular weight organic liquid dispersant, miscible both with liquid hydrocarbon and water, under conditions of high shear stress for a period of time sufficient to produce fibrids characterized by having the combination of both film and fiber morphology, then treating said fibrids with a preservative medium comprising a water-soluble surface active agent having hydrophilic properties under conditions of high shear stress sufficient substantially to displace said dispersant and to preserve the film and fiber morphology of said fibrids and transferring said fibrids from said preservative medium into an essentially aqueous medium.

4,049,493

SELF-BONDING SYNTHETIC WOOD PULP AND PAPER-LIKE FILMS THEREOF AND METHOD FOR PRODUCTION OF SAME

Donald W. Lare, Hamilton, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 496,095, Aug. 9, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,328

Int. Cl.² D21F *11/00*

U.S. Cl. 162—157 R **10 Claims**

1. A method for producing synthetic wood pulp comprising refining solid polyolefin fiber in a low molecular weight organic liquid dispersant, miscible both with liquid hydrocarbon and water, under conditions of high shear stress for a period of time sufficient to produce fibrids characterized by having the combination of both film and fiber morphology and treating said fibrids with a preservative medium comprising a water-soluble surface active agent having hydrophilic properties under conditions of high shear stress sufficient substantially to displace said dispersant and to preserve the film and fiber morphology of said fibrids.

4,049,494

VACCINE PRODUCTION PROCESS

L. David Tomei, Buffalo, N.Y., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 4, 1975, Ser. No. 610,472

Int. Cl.² C12K *7/00*; C12B *3/00*; A61K *39/26*

U.S. Cl. 195—1.1 **4 Claims**

1. A process for producing a vaccine comprising maintaining a viable culture of baby hamster kidney cells in a glutamine-free, serum-free, heat-stable medium formulated to meet the nutritional requirements of baby hamster kidney cells and containing only chemically definable ingredients, inoculating said culture with a foot-and-mouth disease virus, cultivating said virus in the cell culture, and recovering a harvest of virus therefrom.

4,049,495

PHYSIOLOGICALLY ACTIVE SUBSTANCES AND FERMENTATIVE PROCESS FOR PRODUCING THE SAME

Akira Endo; Masao Kuroda; Akira Terahara; Yoshio Tsujita, and Chihiro Tamura, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

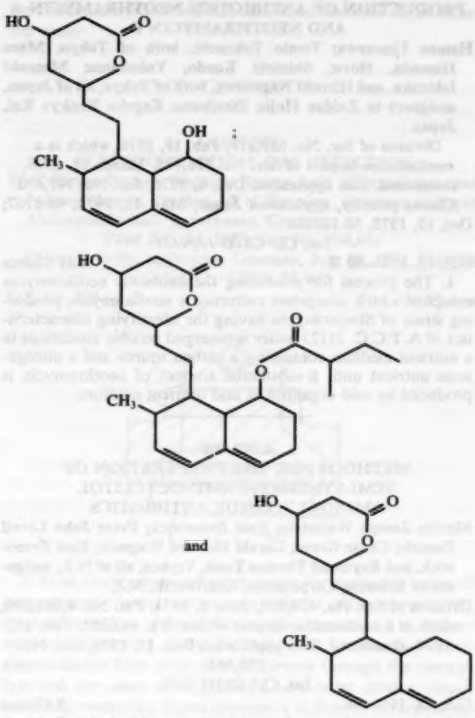
Division of Ser. No. 576,651, May 12, 1975, Pat. No. 3,983,140. This application Dec. 4, 1975, Ser. No. 637,673

Claims priority, application Japan, June 7, 1974, 49-64823

Int. Cl.² C12D *13/02*

U.S. Cl. 195—36 R **5 Claims**

1. A process for the production of substances, ML-236A, ML-236B and ML-236C having the formulae, respectively,



and

which comprises cultivating an ML-236-producing microorganism belonging to the genus *Penicillium* in a culture medium under aerobic condition and recovering said ML-236 substances from the cultured broth.

4,049,496

RAPID SEPARATION OF PLASMA CREATINE KINASE ISOENZYMES

Philip D. Henry, 832 Bricken, Kirkwood, Mo. 63122

Continuation-in-part of Ser. No. 690,556, May 27, 1976, abandoned. This application Dec. 9, 1976, Ser. No. 749,064

Int. Cl.² C07G *7/02*; C12K *1/00*

U.S. Cl. 195—66 R **14 Claims**

1. An in vitro method for effecting rapid separation of the MM and MB creatine kinase isoenzymes in blood plasma or serum and for determining the relative activities of the thus separated isoenzymes comprising the steps of

contacting a blood plasma or serum sample and a buffer of low ionic strength with an ion exchange support comprising porous glass beads having a stationary phase coupled to the surfaces thereof through an intermediate coupling agent;

incubating the resultant mixture to effect MB isoenzyme adsorption by said support;

separating the supernatant liquid fraction containing the MM isoenzyme from said support;

washing the support to effect removal of residual MM;

adding a buffered solution of a strong electrolyte to said support to effect desorption of the MB isoenzyme therefrom;

separating the supernatant liquid fraction containing the MB isoenzyme from said support; and

assaying the MM and MB activity in the respective liquid fractions thus obtained.

4,049,497

PRODUCTION OF ANTIBIOTICS NEOTHRAMYCIN A AND NEOTHRAMYCIN B

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Masa Hamada, Hoya; Shinichi Kondo, Yokohama; Masaaki Ishizuka, and Hiroshi Naganawa, both of Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

Division of Ser. No. 659,319, Feb. 19, 1976, which is a continuation-in-part of Ser. No. 556,985, March 10, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,470

Claims priority, application Japan, Mar. 12, 1974, 49-2767; Oct. 15, 1975, 50-123256

Int. Cl.[2] C12D *13/9/14*

U.S. Cl. 195—80 R 21 Claims

1. The process for producing the antibiotic neothramycin complex which comprises culturing a neothramycin-producing strain of Streptomyces having the identifying characteristics of A.T.C.C. 31123 under submerged aerobic conditions in a nutrient medium containing a carbon source and a nitrogenous nutrient until a substantial amount of neothramycin is produced by said organism in said untrient medium.

4,049,498

METHODS FOR THE PREPARATION OF SEMI-SYNTHETIC AMINOCYCLITOL AMINOGLYCOSIDE ANTIBIOTICS

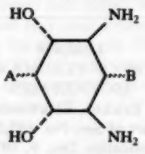
Marvin Joseph Weinstein, East Brunswick; Peter John Lovell Daniels, Cedar Grove; Gerald Howard Wagman, East Brunswick, and Raymond Thomas Testa, Verona, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 476,638, June 5, 1974, Pat. No. 4,011,390, which is a continuation-in-part of Ser. No. 443,052, Feb. 15, 1974, abandoned. This application Dec. 15, 1976, Ser. No. 750,944

Int. Cl.[2] C12D *9/20*

U.S. Cl. 195—96 9 Claims

1. A process for producing Antibiotics Mu-1, Mu-2, Mu-4, Mu-5 and Mu-6 which comprises fermenting *Micromonospora inyoensis* strain 1550F-1G in an aqueous nutrient medium, adding to the fermentation a compound of the formula:



wherein A is a member selected from the group consisting of hydrogen, amino, hydroxy and (C_1–C_2) alkoxy, B is a member selected from the group consisting of hydrogen and hydroxy, wherein the wavy lines connecting A and B to the ring nucleus denote that such groups may be in any of the possible stereoisomeric forms, with the proviso that when B is hydrogen and A is hydroxy, A must be cis to the hydroxyl groups adjacent thereto and with the further proviso that when A is amino, it must be trans to the hydroxy groups adjacent thereto, continuing the fermentation until a composition of matter having substantial antibacterial activity is produced and isolating an antibiotic therefrom.

4,049,499

MICROBIAL MEDIUM HAVING FLUORESCENT GROWTH INDICATOR

Cyrus A. Lepp; Robert D. Mason, both of Painted Post, and William S. Ramsey, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed July 1, 1976, Ser. No. 701,894

Int. Cl.[2] C12K *1/06, 1/10*

U.S. Cl. 195—100 9 Claims

1. A microbial growth medium comprising a semi-solid, gel-like, polar material having incorporated therein 8-anilino-1-naphthalene sulfonic acid or a salt thereof in a quantity sufficient to permit the fluorimetric detection of microbial growth.

4,049,500

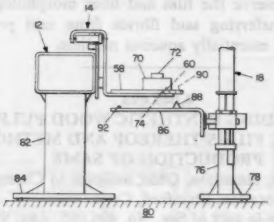
MANUFACTURING MACHINE

Lawrence J. Kamm, 1515 Chatswort Blvd., San Diego, Calif. 92107

Continuation of Ser. No. 468,760, May 10, 1974, Pat. No. 3,998,316. This application Apr. 29, 1976, Ser. No. 681,692

Int. Cl.[2] B65G *17/46*

U.S. Cl. 198—345 1 Claim



1. Apparatus for automatically manipulating a workpiece, comprising, in combination:

conveyor means for transporting a workpiece supporting platen to a work station at which the workpiece is to be manipulated,

first support means for securing the conveyor means to a floor,

second support means independent of the first support means for securing the work station to the floor at a location horizontally offset from the conveyor means,

carriage means for supporting and transporting the platen, the carriage means including a pair of arms which extend under the platen,

means for movably attaching the carriage means to the conveyor means in such a manner that the pair of arms are centilevered towards the work station,

elevator means for lifting the platen vertically from the conveyor means, the elevator means being secured to the second support means such that the elevator means is cantilevered towards the conveyor means so that it can rise between the pair of arms of the carriage means to engage the underside of the platen,

first alignment means for precisely positioning the platen relative to the work station, the first alignment means including at least two precision tapered pins on the elevator means and two mating precision alignment holes on the platen, and

second alignment means for precisely positioning the platen relative to the conveyor means, the second alignment means including at least two additional precision tapered pins on the conveyor means and two additional mating precision alignment holes on the platen.

4,049,501

DEVICE FOR SPOTTING WITHIN TOLERANCE APPARATUS ASSOCIATED WITH THE COKE OVEN CHAMBERS OF A BATTERY

Carl G. Lindgren, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

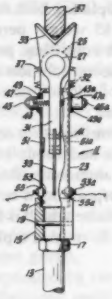
Filed Feb. 11, 1975, Ser. No. 549,076

Int. Cl.[2] C10B *41/00;* G08B *21/00*

U.S. Cl. 202—239 4 Claims

1. Apparatus for aligning a movable powered first structure with a coke oven battery at one or more preselected spotting locations and within a spotting tolerance, comprising:

a. an alignment bar mounted in a selected location on said coke oven battery;
b. a support rod mounted to said movable powered first structure and carrying a tubular housing;
c. a feeler arm pivotally mounted to said tubular housing and having a portion extending outwardly thereof and another portion extending inwardly thereof, said outwardly ex-



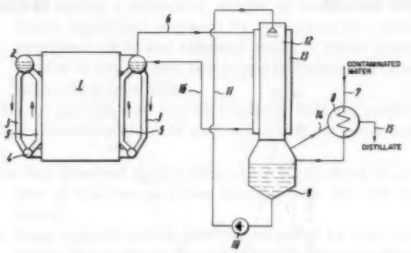
tending portion being adapted to coact with said alignment bar;
d. electrical contactors positioned oppositely in said tubular housing and connected in circuitry with said powered first structure; and
e. means resiliently biasing said feeler arm with respect to said tubular housing.

4,049,502

METHOD OF AND APPARATUS FOR DISTILLING OF LIQUIDS

Günther Nagels, Bramstedt, Wesermunde, Germany, assignor to Klockner-Werke AG, Duisburg, Germany

Filed Sept. 13, 1974, Ser. No. 505,950
Claims priority, application Germany, Sept. 14, 1973, 2346276; June 26, 1974, 2430711
Int. Cl.² B01D *3/02*
U.S. Cl. 203—10 **9 Claims**



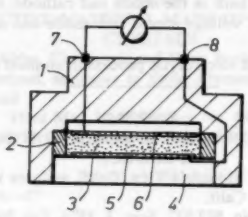
7. A method of supplying heat to a distillation installation for distilling liquids, especially water and aqueous solutions, comprising the steps of cooling a furnace with cooling water by indirect heat exchange; employing the amount of steam which develops during said cooling step as a heat carrier from the furnace to the distillation installation; sensing deviations of the steam amount from a reference value; introducing into the distillation installation an amount of auxiliary steam which depends on the sensed deviations; recovering at least a part of the heat content of the steam and auxiliary steam by condensing the same by indirect heat exchange in the distillation installation; utilizing the recovered heat content in the distillation installation for evaporating volatile components from the liquids undergoing distillation therein; recirculating a part of the condensate, which is obtained in said heat recovering step, from the distillation installation to the furnace for replenishing the supply of the cooling water; and charging the remainder of the condensate from the distillation installation for use as boiler fed water.

4,049,503

ELECTROCHEMICAL GAS DETECTION

Wolf-Jürgen Becker; Wolfram Breuer, both of Leverkusen, and Jacques Deprez, Frechen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 24, 1975, Ser. No. 598,601
Claims priority, application Germany, July 27, 1974, 2436261
Int. Cl.² G01N *27/46*
U.S. Cl. 204—1 T **54 Claims**



1. In an electrochemical gas detector for measuring traces of a component of a gas mixture comprising a cell comprising two electrodes and an organic electrolyte between and in contact with said electrodes, an outer closing circuit connected to said electrodes for flow of an electric current through the electrolyte and the outer closing circuit, said outer closing circuit including measuring means responsive to flow of current in the outer closing circuit, means for introducing a gas mixture into said cell, said cell being adapted for contacting the gas mixture with the electrolyte for changing the electrochemical equilibrium at one of the electrodes for generation of an electrical current in the outer closing circuit, the improvement which comprises said electrolyte consisting essentially of an anhydrous organic gel.

28. Process of measuring the concentration of a reactable component in a gas which comprises contacting the gas with the electrolyte of a detector cell according to claim 1 for reaction of said component to an extent proportional to the concentration of said component in the gas for generation of electric current in said closing circuit to an extend proportional to the concentration of said component in the gas, and measuring an effect on said current as a measure of the concentration of said component in the gas.

4,049,504

METHOD OF PRODUCING LITHOGRAPHIC PRINTING PLATES

Simon L. Chu, Dobbs Ferry, and Eugene Golda, Monsey, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Feb. 23, 1976, Ser. No. 660,569
Int. Cl.² C25D *11/08, 11/12*
U.S. Cl. 204—38 A **10 Claims**

1. A method of producing a lithographic printing plate which comprises applying a lithographically acceptable photosensitive coating to an aluminum sheet, at least one surface of which sheet has been anodized by treatment thereof with an electric current under anodizing conditions in an aqueous electrolyte comprised of a combination of sulfuric and phosphoric acids as the electrolyte.

4,049,505

PHOTOCONDUCTORS FOR ELECTROSTATIC IMAGING SYSTEMS

Arun K. Chatterji, 5409 Fieldstone Drive, Raleigh, N.C. 27609

Continuation-in-part of Ser. No. 512,332, Oct. 14, 1974, abandoned, which is a division of Ser. No. 443,689, Feb. 19, 1974, which is a division of Ser. No. 259,953, June 5, 1972, Pat. No. 3,792,964. This application Apr. 12, 1976, Ser. No. 676,400

Int. Cl.[2] C25D *3/66, 5/00*

U.S. Cl. 204—38 R 7 Claims

1. The method of producing an alloyed photoconductor, comprising

applying a layer of photoconductive material to a substrate, and

diffusing an alloying metal into said layer by an electrolytic process, including

placing the alloying metal and said layer in a heated, molten fluoride salt bath as the anode and cathode, respectively,

applying a DC voltage across said anode and said cathode, and

conducting said electrolytic process in an inert atmosphere.

4,049,506

METHOD FOR COATING BONDING TOOLS AND PRODUCT

Denis K. Gilding, Mountain View, Calif., assignor to Tribotech, Redwood City, Calif.

Division of Ser. No. 502,537, Sept. 3, 1974, Pat. No. 3,986,653. This application June 25, 1976, Ser. No. 699,683

Int. Cl.[2] C25D *11/00;* B23K *3/02*

U.S. Cl. 204—38 R 7 Claims

1. A method for bonding a silicone layer to the surface of a microstructural bonding tool for holding a bonding wire against a surface to which the wire is to be bonded during application of energy thereto, which tool comprises an elongate tool body having a wire guide opening and a bonding surface at the end thereof, the method comprising treating the surface of the hard metal substrate to form pendant groups of the general formula, —OM wherein M is hydrogen or a cation having a valence of one, and contacting the treated surface with a silane of the general formula $(R)_nSi(X)_{4-n}$ wherein n varies from 0 to 3, R is an aliphatic or aromatic group and X is a halogen group or alkoxy radical.

4,049,507

ELECTRODEPOSITING METHOD

Shin-Ichi Tokumoto; Eiji Tanaka; Kenji Ogisu, and Tadao Fujita, all of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 15, 1975, Ser. No. 613,513

Claims priority, application Japan, Sept. 18, 1974, 49-107500

Int. Cl.[2] C25D *3/66*

U.S. Cl. 204—39 4 Claims

1. In the method of electrodepositing titanium onto a cathode immersed in a fused salt bath electrolyte by passing an electrolyzing current between an anode also immersed in said electrolyte and said cathode while intermittently interrupting said electrolyzing current and effecting relative movement between said cathode and said electrolyte; and in which the speed of said relative movement, the density of said electrolyzing current, the frequency at which said electrolyzing current is intermittently interrupted and the duty ratio of the periods during which said electrolyzing current is passed and interrupted, respectively, are parameters affecting the electrodeposition of the titanium on said cathode; the improvement of rotating said cathode so as to effect said relative movement, and substantially changing at least said speed of relative movement periodically in a repeating cycle between a first value and a substantially different second value throughout the time during which titanium is being electrodeposited on the cathode.

4,049,508

TIN-NICKEL PLATING

Ronald J. Morrissey, Cranston, R.I., assignor to Technic, Inc., Cranston, R.I.

Continuation-in-part of Ser. No. 549,357, Feb. 12, 1975, abandoned. This application May 12, 1976, Ser. No. 685,654

Int. Cl.[2] C25D *3/60*

U.S. Cl. 204—43 S 1 Claim

1. An aqueous electroplating bath for plating an alloy consisting substantially of 65 weight percent tin and 35 weight percent nickel, said bath consisting, per gallon of bath, of

a. ½ gallon of an aqueous solution containing about 20–22 ounces per gallon of said solution of nickel in the form of nickel sulfamate, and

b. ½ gallon of an aqueous solution containing about ½ pound of stannous fluoride and about 1 pound of either ammonium bifluoride or ammonium fluoride,

said plating bath incorporating a buffering agent consisting of ammonium sulfamate which is formed in situ on mixing of solutions A and B, to give a pH in the range of 4.0 to 5.5.

4,049,509

PLATING

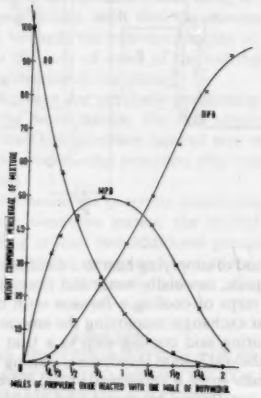
Tony Eugene Such, Wythall; Apoloniusz Wyszynski, Sutton Coldfield, and Barrie Sydney James, Aston, all of England, assignors to W. Canning & Company Limited, Birmingham, England

Continuation-in-part of Ser. No. 500,524, Aug. 26, 1974, abandoned, which is a continuation of Ser. No. 254,426, May 18, 1972, abandoned. This application Mar. 29, 1976, Ser. No. 671,498

Claims priority, application United Kingdom, May 16, 1972, 1379025/72

Int. Cl.[2] C25D *3/12*

U.S. Cl. 204—49 12 Claims



1. A plating additive consisting essentially of:

a. about 45.5 to about 50 parts of monopropoxylated 2-butyne-1, 4diol;

b. about 11.5 to about 33.5 parts of dipropoxylated 2-butyne-1, 4-diol; and

c. about 42.5 to about 17 parts of 2-butyne-1, 4-diol,

all parts by weight based on 100 parts of the three components.

4,049,510
BATHS AND ADDITIVES FOR THE ELECTRODEPOSITION OF BRIGHT ZINC

William E. Rosenberg, Strongsville, Ohio, assignor to Columbia Chemical Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 593,310, July 7, 1975, Pat. No. 3,988,219, and Ser. No. 610,251, Sept. 4, 1975, Pat. No. 4,007,098. This application Oct. 26, 1976, Ser. No. 735,420
Int. Cl.[2] C25D 3/22
U.S. Cl. 204—55 R 35 Claims

1. A zinc brightener additive comprising, from about 1 percent to about 99 percent by weight of a polymeric amine selected from the class consisting of;

a linear aliphatic amine polymer prepared by reacting from about 50 percent to about 200 percent of a stoichiometric amount of an epihalohydrin selected from the class consisting of epichlorohydrin and epibromohydrin with a linear aliphatic polyamine selected from the class consisting of a compound having at least two primary amine groups, two secondary amine groups, one primary and one secondary amine group,

said amine groups separated by two through six methylene groups or alkyl substituted methylene groups,

an aminated polyepichlorohydrin prepared by reacting polyepichlorohydrin with an amine selected from the group consisting of secondary aliphatic amines and secondary alicyclic amines at a temperature of from about 110° C to about 170° C, the amount of said amines is such so that between 50 percent to 100 percent of the chloro groups in said polyepichlorohydrin is reacted,

a polyethylenimine having the repeating unit:

$$+N(R)-CH_2-CH_2+_y$$

where R is hydrogen, methyl, ethyl, propyl, isopropyl, hydroxyethyl, 2-hydroxypropyl, 3-hydroxypropyl, 2-aminoethyl, 2-aminopropyl, and 3-aminopropyl, and *y* is about 10 to about 100, and combinations thereof, and

including from about 99 percent to about 1 percent by weight of a propylene oxide-ethylene oxide block copolymer having a molecular weight of more than 500, said block copolymer prepared by the sequential addition of propylene oxide and ethylene oxide, in either order, to a residue of any organic compound containing a plurality of active hydrogen atoms.

15. An aqueous acid zinc eletroplating bath for producing a bright electrodeposition of zinc, containing zinc ions, comprising;

having dissolved therein from about 0.5 to about 10 grams/liter of a polymeric amine selected from the class consisting of,

a linear aliphatic amine polymer prepared by reacting from about 50 percent to about 200 percent of a stoichiometric amount of an epihalohydrin selected from the class consisting of epichlorohydrin and epibromohydrin with a linear aliphatic polyamine selected from the class consisting of a compound having at least two primary amine groups, two secondary amine groups, one primary and one secondary amine group, said amine groups separated by two through six methylene groups or alkyl substituted methylene groups,

an aminated polyepichlorohydrin prepared by reacting polyepichlorohydrin with an amine selected from the group consisting of secondary aliphatic amines and secondary alicyclic amines at a temperature of from about 110° C to about 170° C, the amount of said amines is such so that between 50 percent to 100 percent of the chloro groups in said polyepichlorohydrin is reacted,

a polyethylenimine having the repeating unit:

$$+N(R)-CH_2-CH_2+_y$$

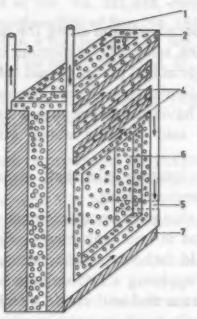
where R is hydrogen, methyl, ethyl, propyl, isopropyl, hydroxyethyl, 2-hydroxypropyl, 3-hydroxypropyl, 2-aminoethyl, 2-aminopropyl, and 3-aminopropyl, and *y* is about 10 to about 100, and combinations thereof, and

including from about 1 to about 10 grams/liter of a propylene oxide-ethylene oxide block copolymer having a molecular weight of more than 500, said copolymer prepared by sequential addition of propylene oxide and ethylene oxide, in either order, to a residue of any organic compound containing a plurality of active hydrogen atoms.

4,049,511
PROTECTIVE MATERIAL MADE OF CORUNDUM CRYSTALS

Hanspeter Alder, Flurlingen, and Hans Boving, Corcelles, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed May 18, 1976, Ser. No. 687,636
Claims priority, application Switzerland, May 30, 1975, 6979/75
Int. Cl.[2] C25C 3/06
U.S. Cl. 204—67 14 Claims



1. In a process for forming a compact crust in the electrolysis of aluminum in a molten electrolyte, for use in protecting a surface portion of an object against both chemical nd electrical reactions, the steps comprising:

forming a molten salt charge comprising an aluminum oxide content in excess of the eutectic composition of said charge;

placing said surface portion in contact with said charge; and

cooling said surface portion sufficiently to precipitate at least part of the aluminum oxide onto said surface portion in the form of corundum crystals, whereby said crust is formed.

4,049,512
CATHODE STRUCTURE FOR ELECTROLYTIC APPARATUS EMPLOYING IMPELLERS

Albert E. Tolle, Jr., 4553 Arrowhead, Baton Rouge, La. 70808

Filed Oct. 31, 1975, Ser. No. 627,599
Int. Cl.[2] C25D 17/12, 21/10
U.S. Cl. 204—212 5 Claims

1. An apparatus for electrolytically extracting metal from salts in a solution on a continuous basis comprising:

a. tank means containing

i. electrically non-conductive conduit means connected thereto for conveying said solution from holding tank means to said tank means, a portion of said conduit

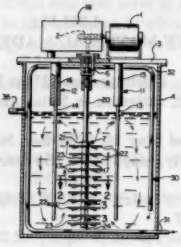
means being located above the surface of the solution contained in said tank means to prevent electrical contact between said tank means and said holding tank means, and

ii. drain outlet means located a distance beneath said portion of said conduit means to prevent said portion of said conduit means from being totally immersed in said solution,

b. an electrically conductive shaft means extending into said solution in said tank means,

c. a plurality of annular spacer means mounted on said shaft means,

d. a plurality of electrically conductive cathode member means rigidly mounted along said shaft means and main-



tained in spaced relation along the length thereof by said spacer means, said cathode member means being mounted so that the principal planes of said cathode member means are perpendicular to said shaft means, said cathode member means having impeller means connected thereto for circulating said solution about said cathode member means,

e. means for rotating said shaft means and said circular cathode member means,

f. at least one elongated anode member means extending into said solution in said tank means adjacent the peripheral edges of said cathode member means, and

g. means for applying a DC voltage between said cathode member means and said anode member means.

4,049,513

TREATMENT OF CELL ANODES

Norman W. Meyers, Islington, Canada, assignor to Erco Industries Limited, Islington, Canada

Filed Mar. 8, 1976, Ser. No. 664,588

Claims priority, application United Kingdom, Mar. 17, 1975, 11048/75

Int. Cl.[2] C25B *11/10, 1/26;* C21D *1/00;* C22C *5/04*

U.S. Cl. 204—290 F **5 Claims**

1. A method of treatment of an electrode having an anodic platinum-iridium alloy surface which has deteriorated in use in the electrolysis of sodium chloride solution to form sodium chlorate and gaseous by-products to the extent that a volume of oxygen of about 3½ to 4% is present in said gaseous by-products, which comprises subjecting said electrode surface to an elevated temperature of from about 350° to about 550° C for a time period of from about 5 minutes to about 5 days to provide an electrode having an improved platinum-iridium alloy surface which when used in said electrolysis results in a volume of oxygen of about 1 to 2% in said gaseous by-products.

4,049,514

ZINC HYDROMETALLURGICAL PROCESS

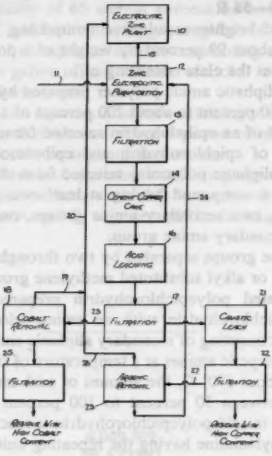
George M. Freeman; John E. Dulson, both of Timmins, and Monica F. Morris, Richmond, all of Canada, assignors to Texasgulf Canada Ltd., Stamford, Conn.

Filed May 13, 1976, Ser. No. 686,064

Claims priority, application Canada, Mar. 11, 1976, 247665

Int. Cl.[2] C25C *1/16;* C22B *3/00*

U.S. Cl. 204—119 **19 Claims**



1. In a process for electrowinning zinc metal wherein copper, cadmium and cobalt contaminants are removed from the impure electrolyte prior to electrolysis, including the formation of a cement copper cake residue fraction, the improvement comprising:

a. subjecting said cement copper cake to an acid leach followed by an alkali addition to extract substantial amounts of zinc, cadmium and coablt in solution and provide a copper-enriched residue;

b. precipitating cobalt from the extraction solution of step (a);

c. separating the precipitated cobalt from the solution in step (b);

d. subjecting said copper-enriched residue of step (a) to a caustic leach to extract arsenic in solution therefrom and provide a copper-enriched cement copper cake product;

e. reacting the arsenic-containing solution from step (d) with a copper salt to form copper arsenate residue and leave a zinc-containing solution;

f. treating said impure electrolyte with said copper arsenate residue to remove said contaminants.

4,049,515

LASER ISOTOPE SEPARATION BY MULTIPLE PHOTON ABSORPTION

C. Paul Robinson; Stephen D. Rockwood; Reed J. Jensen; John L. Lyman, and Jack P. Aldridge, III, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 22, 1975, Ser. No. 570,924

Int. Cl.[2] B01J *1/10*

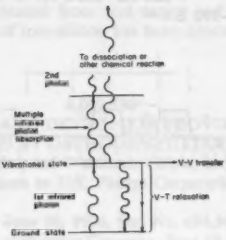
U.S. Cl. 204—157.1 R **12 Claims**

1. A method for obtaining elemental values enriched in a particular isotope of said element which comprises

a. obtaining a fluid comprising first molecular species containing two or more isotopes of said element, said first molecular species having, in the presence of sufficiently intense laser radiation, a density of vibrational levels sufficient to allow multiple photon absorption to higher vibrational levels from a first lower vibrational level by absorp-

tion of photons of the same energy as can excite said first molecular species to said first lower vibrational level;

b. irradiating said fluid with infrared laser radiation of a frequency which selectively excites to a first lower vibrational level those molecules of said first molecular species containing a particular isotope of said element, said infrared laser radiation having an intensity sufficient to produce multiple photon absorption from said first lower vibrational level to a plurality of higher vibrational levels thereby producing a vibrational state at which said molecules containing said particular isotope undergo chemical reaction; and



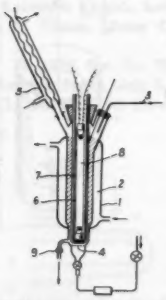
c. separating the reaction products of said chemical reaction from said fluid.

4,049,516

PHOTOCHEMICAL PROCESS FOR THE PRODUCTION OF HALOGENO-ALKANES

Michel Gellato, Billere; Jean-Louis Seris, and Jeannine Suberloco, both of Pau, all of France, assignors to Societe Nationale Elf Aquitaine, Paris, France

Filed July 7, 1975, Ser. No. 593,182
Claims priority, application France, July 11, 1974, 74.24174
Int. Cl.[2] B01J *1/10*; B01K *1/00*
U.S. Cl. 204—158 HA **13 Claims**



1. A photochemical process for producing halogeno-alkanes obtained by reacting ethylenic compounds with bromhydric acid, wherein polymers are prevented from forming and from depositing on the lamp-holder, by performing the reaction in the halogeno-alkane to be obtained, and in the presence of an excess amount of bromhydric acid sufficient to saturate the reaction medium.

4,049,517

PROCESS FOR PREPARING CHLORINATED POLYMER OR COPOLYMER OF VINYL CHLORIDE

Terufumi Adachi, and Tatsuro Oda, both of Shinnan, Japan, assignors to Tokuyama Sekisui Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 2, 1975, Ser. No. 573,830
Claims priority, application Japan, May 18, 1974, 49-55794
Int. Cl.[2] C08F *8/18*
U.S. Cl. 204—159.18 **5 Claims**

1. A process for preparing a chlorinated polymer or copolymer of vinyl chloride which comprises varying the quantity of ultraviolet rays irradiated to a unit amount of the polymer or copolymer in accordance with the progress of the chlorination reaction to control the reaction rate within the range of from 0.75 –0.25 mole/hour/kilogram of the polymer or copolymer until the rate of substitution of chlorine attains at least 1.6 moles/kilogram of the polymer or copolymer, the polymer or copolymer being chlorinated in an aqueous suspension absent any solvent for the polymer or copolymer and under irradiation of ultraviolet rays.

4,049,518

MULTI-STEP RADIATION PROCESS OF PRODUCING POLYOXYMETHYLENES

Akihiko Ito, Takasaki; Akira Shimizu, Tokyo, and Koichiro Hayashi, Neyagawa, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation-in-part of Ser. No. 381,445, July 23, 1973, abandoned, which is a continuation of Ser. No. 144,308, May 17, 1971, abandoned, which is a continuation of Ser. No. 788,637, Jan. 2, 1969, abandoned. This application Aug. 15, 1974, Ser. No. 497,647
Claims priority, application Japan, Feb. 8, 1968, 43-7457
Int. Cl.[2] C08G *2/02*
U.S. Cl. 204—159.21 **11 Claims**

1. A multi-step process of producing polyoxymethylenes by the solid state polymerization of trioxane, which comprises:

a. irradiating trioxane with 5×10^4 to 2×10^6 R of ionizing radiation at a first temperature at which no polymerization of trioxane takes place.

b. then causing polymerization of the irradiated trioxane by raising said first temperature to a second temperature which is at least 15° C above said first temperature at which polymerization of trioxane takes place, said polymerization being effected in the presence of 0.01 to 10% by weight based on the weight of the trioxane of alkyl acetal and

c. thereafter again irradiating the polymerized product thus obtained with a dose from 5×10^4 to 10^6 R and

d. further polymerizing the irradiated product of (c).

4,049,519

CARBONATE REDUCTION

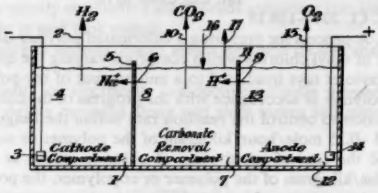
Walter John Sloan, 214 Jupiter Road, North Star, Newark, Del. 19711

Filed Oct. 6, 1976, Ser. No. 730,086
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—180 P **14 Claims**

1. A process for the removal of carbonate ions from solutions, comprising the steps of:

1. providing electrolytic cell having at least three compartments with two cation permselective membranes separating the cell into anodic, cathodic and carbonate removal compartments;
2. adding an acidic solution to the anodic compartment;
3. adding an electrolytically conductive solution to the cathodic compartment of the electrolytic cell;
4. adding the solution containing carbonate ions to the carbonate removal compartment located between the anodic and cathodic compartments of the electrolytic cell;
5. applying energy, as direct electrical current by the use of

the anode and the cathode in the electrical cell, to cause hydrogen ions present in the acidic solution to leave the anodic compartment, pass through the adjacent cation permselective membrane, and enter the carbonate removal compartment holding the solution containing carbonate ions, neutralizing any causticity, and converting carbonate ions to bicarbonate ions which, in turn, are



converted to carbonic acid which decomposes to water and carbon dioxide; and

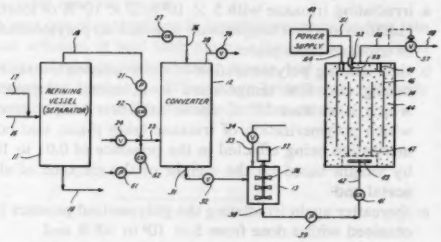
6. concomitantly, causing cations, because of the applied electrical potential, to leave the carbonate removal compartment, enter the cathodic compartment by passing through the second cation permselective membrane, and mix, in the cathodic compartment, with the electrolytically conductive solution.

4,049,520

COLOR IMPROVEMENT PROCESS FOR ORGANIC LIQUID

Oliver Wagner, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Mar. 19, 1976, Ser. No. 668,561
Int. Cl.² B03C 5/00
U.S. Cl. 204—186 **27 Claims**



1. A process for the hydrogenation and purification of a substance selected from the group consisting of fats, animal oils and vegetable oils comprising:

a. refining said substance to remove gross impurities;

b. forming a mixture of the refined product of step (a), a finely divided hydrogenation catalyst and a finely dispersed solid adsorbent adapted to remove color bodied in an atmosphere substantially devoid of oxygen-containing gases;

c. hydrogenating the refined product of step (a) with hydrogen in the presence of said hydrogenation catalyst and said solid adsorbent, and at elevated temperatures, thereby producing a hydrogenated product carrying the entrained hydrogenation catalyst and the solid adsobent; and

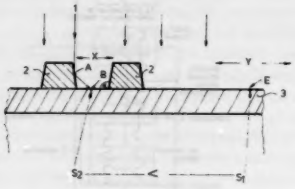
d. in an atmosphere substantially devoid of oxygen-containing gases, subjecting the product of step (c) to electrofiltration for the substantially complete removal of the hydrogenation catalyst and solid adsobent from said hydrogenated product, thereby providing a solids-free, color improved hydrogenated product.

4,049,521

CATHODE SPUTTERING METHOD FOR THE MANUFACTURE OF ETCHED STRUCTURES

Ursula Convertini, Borstel; Heinz Dimigen, Hamburg, and Holger Lüthje, Halstenbek, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 7, 1976, Ser. No. 693,491
Claims priority, application Germany, June 13, 1975, 2526382
Int. Cl.² C23C 15/00
U.S. Cl. 204—192 E **8 Claims**



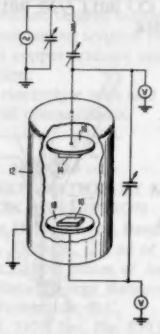
1. A cathode sputtering method for the manufacture of etched structures in substrates covered with etching masks, in which the etching mask leaves exposed areas of different sizes on the substrate and in which said substrates are arranged on a cathode in a sputtering space and a gas discharge is initiated and maintained between the cathode and an anode, characterized in that the ratio of the distance d between anode and substrate to the average free path length of the atoms of the sputtered material, that is d/λ, is at least 1, and is adjusted so that the etching rates in the small and large areas of the layer to be etched are substantially equally large.

4,049,522

LOW COERCIVITY IRON-SILICON MATERIAL, SHIELDS, AND PROCESS

Norman George Ainslie, Croton-on-Hudson; Robert Douglas Hempstead, Yorktown Heights; Swie-In Tan, Bedford Hills, all of N.Y., and Erich Philipp Valstyn, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1976, Ser. No. 662,198
Int. Cl.² C23C 15/00
U.S. Cl. 204—192 M **3 Claims**



1. A substrate having deposited thereon a thin film of iron-silicon made by the process comprising the steps of:

placing a substrate upon the anode of an R.F. sputtering chamber,

placing a target of iron-silicon containing about 4% to 7% silicon upon the cathode of said sputtering chamber,

spacing said cathode and said anode about ½ inch to 2 inches apart,

impressing an R.F. potential greater than 1200 volts upon

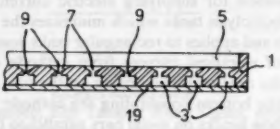
said cathode for sputtering material from said target of iron-silicon at a rate greater than 150A/min onto said substrate to a thickness greater than ¼ micron upon the said substrate, while maintaining a bias between about minus 2.5 and minus 60 volts upon the anode and the substrate to be coated, and maintaining a temperature at the anode above 250° C, in an evacuated atmosphere of argon as a sputtering gas at a pressure above 10 microns, stopping the deposition of iron-silicon upon said substrate by removing potential from said target and said substrate after a layer of iron-silicon has been deposited upon said substrate.

4,049,523

METHOD OF AND DEVICE FOR PROVIDING THIN LAYERS BY CATHODE SPUTTERING

Ralf-Dieter Boehnke, and Waldemar Götze, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 10, 1976, Ser. No. 694,842
Claims priority, application Germany, June 18, 1975, 2527184
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 R **4 Claims**



1. In a method of providing thin layers on a substate by cathode sputtering from a compressed powder target in a vacuum, the improvement wherein any gases adsorbed in the compressed powder target are removed therefrom through surface pores including pores in the bottom surface of the target.

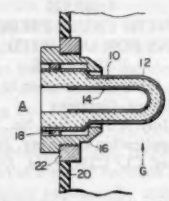
3. A supporting dish for supporting a compressed powder target, the bottom surface and side surfaces of said dish having apertures extending normal to the surfaces, in which the apertures on the surfaces adapted to face the target are formed as funnels which change into neck portions and emerge into parallel extending ducts which are provided on the surfaces of the supporting dish remote from the powder target.

4,049,524

OXYGEN SENSOR WITH NONCATALYTIC ELECTRODE

Kimmochi Togawa, Yokohama; Hiroshi Takao, Kamakura; Kazuo Matoba, and Katsuhiro Kishida, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jur 30, 1976, Ser. No. 701,185
Claims priority, application Japan, July 8, 1975, 50-83088
Int. Cl.² G01N *27/30, 27/46*
U.S. Cl. 204—195 S **10 Claims**



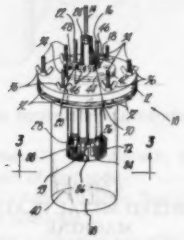
1. In an oxygen sensor for sensing the difference in oxygen concentration between two gases, the sensor having a layer of solid oxygen-ion electrolyte, a first electrode layer formed on one side of the electrolyte layer to be exposed to a gas subject to measurement and a second electrode layer formed on the opposite side of the electrode layer to be exposed to a reference gas, both the first and second electrode layers being permeable to gas, the improvement comprising said first electrode layer being made of a material comprising carbon silicide as a sole conductive component thereof.

4,049,525

CORROSION TEST CELL

Daniel Ronan Dutton, Woodhaven, and Thomas Carl Musolf, Southgate, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 14, 1976, Ser. No. 732,540
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 C **4 Claims**



1. A corrosion test cell assembly suitable for determining the electrochemical corrosion parameters of metals in corrosive liquid environments comprising;

a. an electrically non-conductive vessel for receiving an electrolyte solution,

b. an electrically non-conductive cover member adapted to be secured to said vessel,

c. a plurality of metallic rods supported in said cover member in electrical isolation, both ends of said rods extending axially from said cover member, one end of each rod having terminal connector means thereon and supported within said vessel, the other end of each of said rods being connectable to suitable electrical conducting means, one of said rods being centrally located in said cover member, the remaining rods being arranged symmetrically around said central rod,

d. a reference electrode secured to said terminal means of said centrally located rod and adapted to be supported within an electrolyte solution in said vessel,

e. at least one of said terminal means of one of the remaining rods adapted to secure a test electrode thereon and supportable within an electrolyte solution in said vessel,

f. an auxiliary electrode surrounding said reference electrode and said metal rods,

g. insulating fluid seals encircling said terminal means and adapted to be engaged in fluid tight relationship between said terminal means and electrodes secured thereon,

h. said electrical conducting means providing circuits with said electrodes during said determination of electrochemical corrosion parameters.

4,049,526

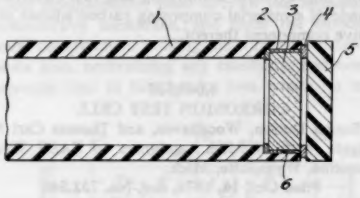
EXTENDED-LIFE ELECTRODE

James I. Maurer, St. Clair Shores, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Sept. 16, 1976, Ser. No. 723,821
Int. Cl.² G01N *27/30*
U.S. Cl. 204—195 M **2 Claims**

1. An extended-life electrode suitable for measuring the concentration of fluoride ion in an aqueous solution comprising an insulating electrode shell having an aperture therein, a fluoride sensitive membrane adapted to cover said aperture, a layer of slow-setting cement located between the membrane

and the perimeter of the shell aperture and adherent to both the membrane and shell and means for isolating the slow-setting



cement layer from the solution comprising a cyanoacrylate glue adhered to the membrane and the shell.

4,049,527

ELECTRODEPOSITED METAL PLATE PEELING-OFF MACHINE

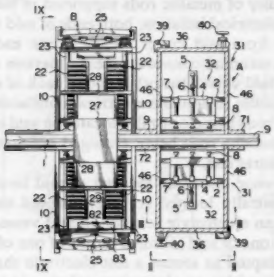
Takeshi Harimoto, and Keisuke Nishiyama, both of Shimonoseki, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1977, Ser. No. 756,187

Claims priority, application Japan, Jan. 8, 1976, 51-1879; Jan. 8, 1976, 51-1880

Int. Cl.² C25C *7/08*; C25D *1/20*

U.S. Cl. 204—198 **3 Claims**



1. In the electrodeposited metal plate peeling off machine equipped with a hammering apparatus, a peeling off apparatus and a transfer means installed throughout the foregoing two apparatuses for the purpose of intermittently transferring a cathode plate composed of the electrodeposited metal plates and the base plate holding said electrodeposited metal plates thereon from the hammering apparatus to the peeling off apparatus, a peeling off machine which is characterized in that said hammering apparatus comprises a hammering means accommodated in a sound insulating box of entirely closed type construction built of sound insulating materials except for the provision of longitudinal slits formed on the confronting two side walls thereof perpendicular to the direction of progress of the transfer means for the purpose of passing cathode plates to be transferred, and said peeling off apparatus is equipped with nozzle pipes having a slit-like nozzle, respectively, fronting on the upper part of the electrodeposited metal plate as a prescribed distance and disposed substantially parallel thereto, coupled with a blower to supply a low-pressure gas to said nozzle pipe continuously.

4,049,528

METHOD AND A DEVICE FOR THE SUPPLY OF ELECTRIC CURRENT TO TRANSVERSE IGNEOUS ELECTROLYSIS TANKS TO MINIMIZE EFFECTS OF MAGNETIC FIELDS

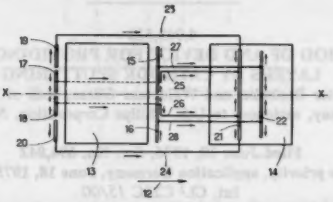
Paul Morel, Le Vesinet, and Jean-Pierre Dugois, Saint Jean-de-Maurienne, both of France, assignors to Aluminum Pechiney, Lyon, France

Filed Mar. 26, 1976, Ser. No. 670,898

Claims priority, application France, Sept. 18, 1975, 75.29181

Int. Cl.² C25C *3/06, 3/00*

U.S. Cl. 204—243 M **7 Claims**



1. A method for supplying electric current to transverse igneous electrolysis tanks which minimizes the effects of magnetic fields and applies to rectangular tanks connected in series for flow of electrical current from cathode of one tank to anode of the next tank comprising on the one hand a crucible of which the bottom constituting the cathode is formed from sealed carbon blocks on metal bars parallel to the small side of the tank, and on the other hand an anode formed from carbonaceous anodic blocks suspended from one or the other of the two metal cross pieces parallel to the large side of the tank, this method being characterized in that one anode cross piece of the downstream tank is supplied with current by conductors connected to the ends of the cathode bars on the downstream side of the downstream tank, the other anode cross piece of the downstream tank being supplied with current by one set of conductors connecting the other anode cross piece with one set of cathode bars from the upstream side and another set of conductors connecting another set of cathode bars from the upstream side of the upstream tank, one set of conductors passing about the outside of the upstream tank while the other set of conductors pass underneath the upstream tank whereby the magnetic fields created by the different supply conductors cancel one another out.

4,049,529

APPARATUS WITH CRUST PIERCING AND GAS FEEDING MEANS FOR USE WITH ELECTROLYTIC FURNACES

Franz Golla, Lunen, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Filed July 9, 1976, Ser. No. 703,947

Claims priority, application Germany, July 10, 1975, 2530831

Int. Cl.² C25C *3/14, 7/00*

U.S. Cl. 204—246 **7 Claims**

1. Apparatus for use with an electrolytic furnace producing aluminium; said apparatus comprising at least one tool-carrying means disposed above a bath of the furnace containing molten aluminium, means for raising and lowering said tool-carrying means to break up the crust formed on the molten aluminium during operation of the furnace, nozzle means for

discharging gas carried by said tool-carrying means and means for raising and lowering said nozzle means in relation to the

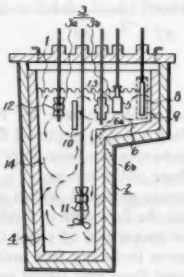
tool carrying means whereby the nozzle means can inject gas into the molten aluminium.

4,049,530

ELECTROLYZER

Shin-Ichi Tokumoto; Eiji Tanaka; Kenji Ogisu, and Masahisa Enomoto, all of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 26, 1975, Ser. No. 617,185
Claims priority, application Japan, Sept. 30, 1974, 49-112537
Int. Cl.[2] C25D *21/10, 21/02;* C25C *3/00, 7/00*
U.S. Cl. 204—273 **9 Claims**



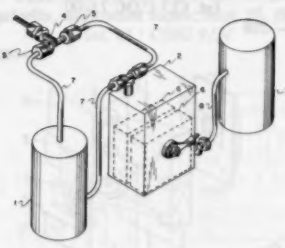
1. An electrolyzer comprising a vessel containing an electrolyte, said vessel having a first portion having a cooling means for maintaining a relatively low temperature in which the electrolyte therein is maintained at a relatively low temperature and a second portion having a heating means for maintaining a relatively high temperature in which the electrolyte therein is maintained at a relatively high temperature, cathode and anode electrodes immersed in the electrolyte in said first portion of the vessel, and a plurality of stirring members disposed in said cooling and electrolyte sections of said first and second portions for producing circular flows of the electrolyte within said first and second portions, respectively, of the vessel and within said vessel as a whole between said first and second portions so as to achieve substantially continuous electrolysis, said vessel being relatively deep at one side and relatively shallow at the other side, said second portion being defined at the bottom of said relatively deep side, said cooling section being defined at the top of said relatively deep side and at said relatively shallow side, and said electrolyte section being defined by said relatively shallow side.

4,049,531

ELECTROLYTIC HYPOCHLORITE GENERATOR

Stephan C. Ban, 9009 Mears St., Fairfax, Va. 22030

Filed July 19, 1976, Ser. No. 706,360
Int. Cl.[2] C25B *1/26, 15/08*
U.S. Cl. 204—275 **9 Claims**



1. An electrolytic hypochlorite generating system comprising:

a container of metallic chloride salt, an electrolytic cell containing a pair of electrodes,

means to provide a stable trickling flow of water to an upper portion of said container,

means to withdraw a saturated salt solution from lower end of said container,

means to mix a second trickling flow of water with said solution and drip the mixture into said electrolytic cell,

means to supply electrical power to said eletrodes including electrical connectors distinct from said electrodes and formed of carbon impregnated with a water repellant material, and

means to withdraw a hypochlorite solution from a lower portion of said electrolytic cell.

4,049,532

ELECTRODES FOR ELECTROCHEMICAL PROCESSES

Lucien Clerbois, Vilvoorde; Louis Degueldre, Brussels, both of Belgium; Christian Biver, Hagen, Luxembourg; Albert Degols, Berg, and Yves Gobillon, Brussels, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Continuation of Ser. No. 258,539, June 1, 1972, abandoned. This application Sept. 23, 1974, Ser. No. 508,391
Claims priority, application Luxembourg, June 2, 1971, 63263; May 4, 1972, 65296
Int. Cl.[2] C25B *11/10*
U.S. Cl. 204—290 F **12 Claims**

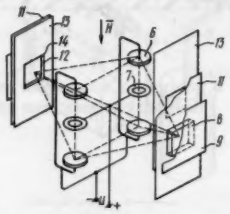
1. In an electrode for electrochemical processes having an electrically conductive and relatively inert support at least the surface layer of which is of titanium or a titanium alloy, and an at least partial coating for said support, said coating being a protective and electrocatalytic layer obtained by heating on said support, in an oxidizing atmosphere at a temperature between 350° and 800° C, a coating composition consisting essentially of at least one thermally decomposable compound of iridium in a liquid vehicle, said iridium compound decomposing during the heating of the coating composition to provide said iridium in a metallic and/or oxide state, and at least one thermally decomposable compound of a non noble element selected from the group consisting of lithium, boron, beryllium and gallium in an atomic ratio iridium/non noble element of 1/4 to 8/1, said thermally decomposable compound of the non noble element decomposing during the heating of the coating composition to an oxide of the non noble element.

4,049,533

DEVICE FOR PRODUCING COATINGS BY MEANS OF ION SPUTTERING

Vyacheslav Mikhailovich Golyanov, ulitsa Rogova, 2, kv. 163, and Alek Platonovich Demidov, ulitsa Rogova, 3, kv. 8, both of Moscow, U.S.S.R.

Filed Sept. 10, 1975, Ser. No. 611,918
Int. Cl.² C23C *15/00*
U.S. Cl. 204—298 **14 Claims**



1. A device for producing films by means of ion sputtering of substances in an ionized gas atmosphere, comprising: a vacuum discharge chamber comprising cooling means, a magnetic field source means, a vacuum evacuation system and an inert gas supply means; at least two pairs of cathodes arranged in the chamber, the geometrical centers of flat sputterable surfaces of the cathodes being equally spaced from each other in each pair of cathodes and being found in parallel plane, each pair of cathodes having an anode equally spaced from the cathodes forming each respective pair, all anodes of all of the pairs of cathodes being located in a plane parallel to the planes in which the cathodes are found at least one holder adapted to hold articles to be coated arranged in the plane in which all of the anodes are located at the point of convergence and overlapping of atomic beams of sputtered material from all of the cathodes; and a power source of all of the cathodes and anodes of the chamber.

11. A device for producing films by means of ion sputtering of substances in an ionized gas atmosphere, comprising: a vacuum discharge chamber comprising cooling means, a magnetic field source means, a vacuum evacuation system and an inert gas supply means; two pairs of cathodes arranged in the chamber, the geometrical centers of flat sputterable surfaces of the cathodes being equally spaced from each other in each pair of cathodes and being found in parallel planes, each pair of cathodes having an anode equally spaced from the cathodes forming each respective pair, all anodes of all of the pairs of cathodes being located in a plane parallel to the planes in which the cathodes are found, the geometrical centers of the cathodes being found at four apexes of the lattice base of an imaginary octahedron; two holders, each of the holders adapted to hold an article located at each of the distal apexes of the octahedron opposite the lattice base; and a power source of all of the cathodes and anodes of the chamber.

4,049,534

ELECTROPHORECTIC APPARATUS FOR ELUTION FROM PREPARATIVE GELS

Israel Posner, Caracas, Venezuela, assignor to E-C Apparatus Corporation, St. Petersburg, Fla.

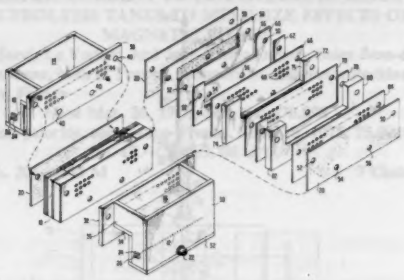
Filed Apr. 12, 1976, Ser. No. 676,178
Int. Cl.² G01N *27/28*
U.S. Cl. 204—299 R **9 Claims**

1. An apparatus for elution electrophoresis of components separated by analytical electrophoresis comprising:

a. a plurality of compartments containing a buffer solution;

b. electrode means disposed within each compartment; and

c. a plurality of recovery cells disposed between said compartments, said cells separated from each other and the compartments by dialysis membranes, each of said recovery cells having three sections, a first section holding buffer solution, a second section containing a gel having



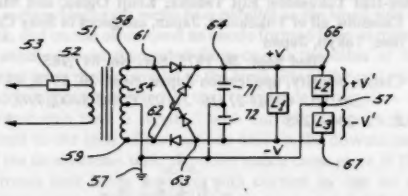
the component to be eluded, and a third section for recovering the elution.

4,049,535

ELECTRICAL TREATER WITH A.C-D.C. ELECTRICAL FIELDS

Joseph D. Winslow, Jr., Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 22, 1975, Ser. No. 643,224
Int. Cl.² C10G *33/02*
U.S. Cl. 204—305 **12 Claims**



1. An electrical treater system for resolving water-in-oil emulsion by grading a.c.-d.c. electrical fields, comprising:

a. vessel means having emulsion inlet means, and oil phase and water phase outlet means;

b. electrode means mounted within said vessel means arranged to be in the flow path of fluid moving between said emulsion inlet means and oil phase outlet means, and said electrode means including first and second sets of electrodes insulated from said vessel means and adapted for simultaneous energization by an external power source to d.c. potentials relative to each other and a.c. potential components above ground for resolving the emulsion into a treated oil phase and a coalesced water phase;

c. said external power source including power transformer means connectable to an a.c. source of current for providing elevated a.c. potentials at end terminals of a secondary in electrical isolation to the a.c. source of current and earth ground, and said secondary having a center tap connected to earth ground with a floating full wave rectifier bridge connected at opposite arm junctions to the end terminals of said secondary and at the remaining arm junctions as positive and negative d.c. source terminals to said first and second sets of electrodes, respectively;

d. said electrode means including a grounded electrode disposed in spaced relations to said first and second sets of electrodes and arranged to be upstream from said sets of electrodes relative to the direction of flow of the emulsion; and

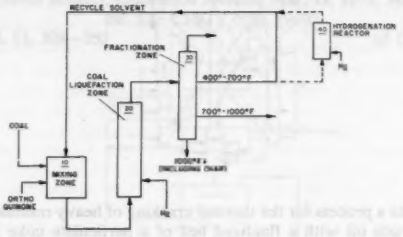
e. control means for maintaining a body of treated oil phase about said first and second sets of electrodes and extending toward said grounded electrode, whereby emulsion

within said vessel means is subjected to grading a.c.-d.c. electrical fields during resolution and substantial unbalance in d.c. current demand in said first and second sets of electrodes fails to disrupt the a.c.-d.c. electrical fields.

4,049,536
COAL LIQUEFACTION PROCESS

Karl W. Plumlee, and Lonnie W. Vernon, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed May 17, 1976, Ser. No. 686,813
Int. Cl.² C10G *1/06*
U.S. Cl. 208—10 **15 Claims**

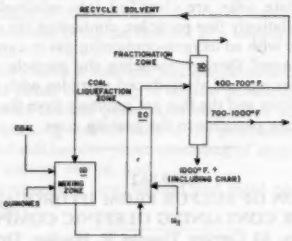


1. A process for liquefying a particulate coal feed to produce useful petroleum-like liquid products, which comprises: (a) admixing said coal feed, a solvent, and an ortho-quinone compound to form a coal liquid slurry, and then (b) contacting said coal liquid slurry with molecular hydrogen in a liquefaction zone at temperature and pressure sufficient to hydroconvert and liquefy the coal to form a liquid product mixture.

4,049,537
COAL LIQUEFACTION PROCESS

Karl W. Plumlee, and Lonnie W. Vernon, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed May 17, 1976, Ser. No. 686,814
Int. Cl.² C10G *1/06*
U.S. Cl. 208—10 **14 Claims**

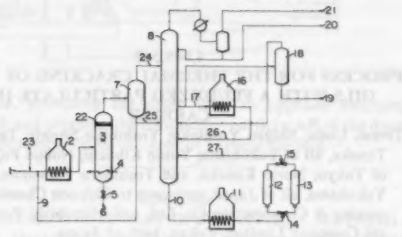


8. A process for liquefying a particulate coal feed to produce useful petroleum-like liquid products, which comprises: (a) admixing said coal feed, a non-donor solvent, and a quinone compound, or admixture of quinone compounds, to form a coal liquid slurry, and then (b) contacting said coal liquid slurry with molecular hydrogen in a liquefaction zone at temperature and pressure sufficient to hydroconvert and liquefy the coal.

4,049,538
PROCESS FOR PRODUCING HIGH-CRYSTALLINE PETROLEUM COKE

Kiyoshige Hayashi, Tokyo; Mikio Nakaniwa, Ohme; Nobuyuki Kobayashi, Ichihara; Minoru Yamamoto, Ichihara, and Yoshihiko Hase, Ichihara, all of Japan, assignors to Maruzen Petrochemical Co. Ltd., Tokyo, Japan

Filed Sept. 15, 1975, Ser. No. 613,541
Claims priority, application Japan, Sept. 25, 1974, 49-110316
Int. Cl.² C10G *9/14*
U.S. Cl. 208—50 **6 Claims**



1. A process for producing a high-crystalline petroleum cole from a petroleum feedstock which comprises the steps of:

heating the petroleum feedstock in a tube heater to a temperature of 430°–520° C under a pressure of 4–20 Kg/cm²G and in the presence of a small proportion of a basic compound selected from the group consisting of hydroxides and carbonates of alkali and alkaline-earth metals;

maintaining the feedstock in the tube heater at that temperature for 30–500 seconds to effect cracking and soaking thereof;

introducing the feedstock thus heat-treated into a high-temperture flashing column, where a flash distillation is effected at high-temperative temperature of 380°–480° C under a pressure of 0–2 Kg/cm²G;

continuously removing non-crystalline substances contained in the feedstock as pitch from the bottom of the flashing column;

fractionating in a fractionating column the distillate from the flashing column into cracked gas, gasoline, gas oil and heavy residue; and

introducing the heavy residue, after heating to a temperature required for the subsequent delayed coking, into a coking drum, where it is subjected to delayed coking at a temperature of 430°–460° C under a pressure of 4–20 Kg/cm² G for at least 20 hours, thereby forming a high-crystalline petroleum coke having a coefficient of thermal expansion in the direction parallel to the extrusion of less than 1.0×10^{-6} C over 100°–400° C when measured in the form of an extruded graphite artefact thereof.

4,049,539
TWO-STAGE PROCESS FOR UPGRADING NAPHTHA

Tsoung Y. Yan; Tracy J. Huang, and Werner O. Haag, all of Trenton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed June 13, 1975, Ser. No. 586,850
Int. Cl.² C10G *39/00*
U.S. Cl. 208—65 **10 Claims**

1. A process for upgrading a naphtha feed stock comprising the stages of (1) reforming said feed stock at from about 100° to about 300° F by contacting said feed stock with an alumina catalyst containing a platinum group metal selected from Group VIII of the Periodic Table and also containing from about 5 to about 15% by weight of halogen and (2) subjecting the effluent to a further reforming stage employing a platinum-containing alumina catalyst having therein less than about 1% by weight of chlorine, at a temperature of from about 850° to

about 1000° F, at a pressure of from about 50 to about 1000 psig and at an LHSV of from about 0.5 to about 10.

4,049,540

PROCESS FOR THE THERMAL CRACKING OF HEAVY OILS WITH A FLUIDIZED PARTICULATE HEAT CARRIER

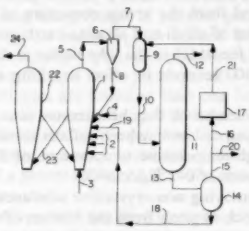
Tetsuo Ueda; Shigeo Yoshioka; Yoshihiko Shohji; Tsunemitsu Tanaka, all of Yokohama; Yukio Kikuchi; Nobuo Fujita, both of Tokyo; Norio Kaneko, and Toshiharu Tanemoto, both of Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co. Ltd. and Mitsubishi Petrochemical Company Limited, Tokyo, both of Japan

Filed Mar. 4, 1976, Ser. No. 663,818

Claims priority, application Japan, Mar. 8, 1975, 50-27599; Mar. 11, 1975, 50-28684

Int. Cl.² C10G 9/32

U.S. Cl. 208—127 **6 Claims**



1. In a process for the thermal cracking of heavy oils with a fluidized bed of a particulate heat carrier wherein (a) a fluidized bed of the particulate heat carrier is formed in a reactor by fluidization with fluids comprising a heavy oil feed and steam; (b) said heavy oil is thermally cracked at a temperature of 700° to 850° C to form a cracked oil product; (c) the cracked oil product together with particulate heat carrier escaping from the reactor is passed through a cyclone to remove a major portion of the particulate heat carrier therefrom; (d) the particulate heat carrier removed from the cracked oil product in the cyclone is returned to the reactor; (e) the cracked oil product containing the remaining portion of said particulate heat carrier is quenched to provide a cracked oil having the remaining particulate heat carrier suspended therein; and (f) said cracked oil is fractionated to provide a relatively high boiling oil containing the particles of the heat carrier suspended therein; the improvement comprising: locating the cyclone for separating the particulate heat carrier from the cracked oil product outside the reactor; returning the portion of the particulate heat carrier removed in the cyclone to the reactor at a position which is below the position where said heavy oil is fed into the reactor; separating said high boiling oil and said remaining portion of particulate heat carrier in a gravitational separator wherein the high boiling oil is separated into two portions, one containing relatively coarse particles of the particulate heat carrier densely suspended therein and the other containing relatively fine particles of the particulate heat carrier suspended therein, and returning said relatively coarse particles of the particulate heat carrier to said fluidized bed.

4,049,541

PROCESS FOR CONTROLLING THE SIZE OF COKE PARTICLES WITHIN A FLUIDIZED BED

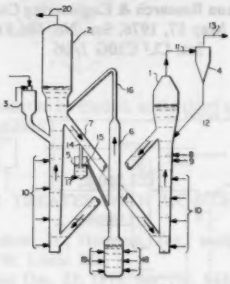
Tetsuo Nakagawa, Fujisawa; Nobuo Matsuda, Kawasaki; Kazumitsu Mitani, Tokyo, and Toshiharu Tanemoto, Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co. Ltd. and Mitsubishi Petrochemical Company Limited, both of Japan

Filed Mar. 5, 1976, Ser. No. 664,389

Claims priority, application Japan, Mar. 11, 1975, 50-28601

Int. Cl.² C10G 9/32

U.S. Cl. 208—127 **4 Claims**



1. In a process for the thermal cracking of heavy residual oil or crude oil with a fluidized bed of a particulate coke heat carrier in a system comprising a fluidized bed reaction zone for cracking said heavy residual oil or crude oil and a heating zone for heating said particulate coke heat carrier and wherein heavy residual oil or crude oil is thermally cracked at a high temperature by means of a fluidized bed consisting of coke particles and steam under conditions which maintain a positive coke balance in the system such that an amount of coke is formed that is greater than an amount of coke lost during operation of said process; particulate coke from the fluidized bed reaction zone is circulated to said heating zone wherein it is heated and said heated particulate coke heater carrier is returned to said fluidized bed reaction zone; the improvement for controlling the coke balance and the size of the particles of said particulate coke heat carrier in a range adapted for continuous operation comprising: withdrawing a portion of the particulate coke heated in the heating zone from a position intermediate said heating zone and said reaction zone; providing a storage zone for receiving said withdrawn particulate coke, the particles of the particulate coke heat carrier being maintained in a fluidized state in the storage zone by means of a gas introduced thereinto; passing a controlled amount of the withdrawn particulate coke to a pneumatic classifier wherein the particles of the particulate coke are classified into relatively coarse particles and relatively fine particles; contacting the relatively coarse particles with an oxygen-containing gas to cause partial combustion thereof thereby reducing the particle size and, thereafter, returning said sizereduced particles with said relatively fine particles and the flue gas resulting from the combustion of the coarse particles to the heating zone.

4,049,542

REDUCTION OF SULFUR FROM HYDROCARBON FEED STOCK CONTAINING OLEFINIC COMPONENT

Kirk R. Gibson, El Cerrito; Thomas R. Hughes, Orinda, and Robert L. Jacobson, Pinole, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 4, 1976, Ser. No. 729,244

Int. Cl.² C10G 23/02

U.S. Cl. 208—213 **10 Claims**

1. A process for reducing the combined-sulfur content of a normally liquid hydrocarbon feedstock boiling below about 300° C and containing an olefinic hydrocarbon component, comprising contacting a mixture of said feedstock and hydro-

gen gas with a catalyst comprising copper metal, said contacting being effected without materially hydrogenating said olefinic component and under conditions including:

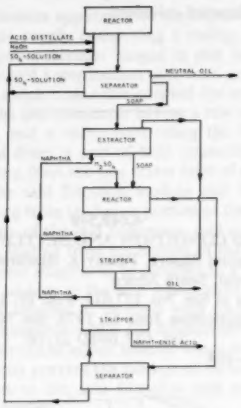
a. a hydrogen partial pressure in the range of from about 0.2 to about 20 atmospheres;
b. a temperature in the range of from about 120° C to 400° C; and
c. at a liquid hourly space velocity in the range of from about 0.1 to 15.

4,049,543

METHOD FOR THE SEPARATION OF A MIXTURE OF PETROLEUM ACIDS FROM PETROLEUM DISTILLATES CONTAINING SUCH A MIXTURE

Carl Arne Bergholm, Nynashamn, Sweden, assignor to AB Nynas-Petroleum, Stockholm, Sweden

Filed Mar. 19, 1975, Ser. No. 559,854
Claims priority, application Sweden, Mar. 19, 1974, 7403685
Int. Cl.² C10G *17/00, 19/00*
U.S. Cl. 208—263 **15 Claims**



1. The method which comprises

a. providing a liquid petroleum distillate containing a mixture of petroleum acids, at least 10% of the petroleum acids having a molecular weight less than 260 and at least 50% of the acids having a molecular weight of more than 260,
b. treating said petroleum distillate in at least one reaction zone with the combination consisting of:
   1. an aqueous solution of sodium hydroxide, and
   2. sodium sulfate in an amount equal to 10 - 15% by weight of the aqueous solution of sodium hydroxide,

said treatment being carried out at a temperature of at least 85° C,

to thereby form a reaction mixture containing

a first phase consisting of neutral petroleum distillate,
a second heavier phase consisting of an aqueous mixture containing sodium salts of the petroleum acids, and
a third still heavier phase consisting of an aqueous solution of sodium sulfate, and

c. separating said first, second and third phases from one another.

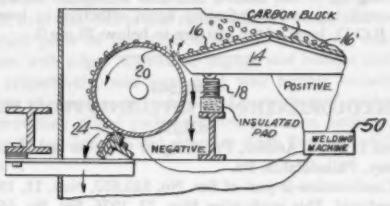
4,049,544

METHOD AND DEVICE FOR SEPARATING PARTICLES

Henry Neil Turner, 95-3rd St. NE., Graysville, Ala. 35073

Continuation-in-part of Ser. No. 539,169, Jan. 7, 1975, abandoned. This application Apr. 28, 1976, Ser. No. 681,173
Int. Cl.² B07B *13/00*
U.S. Cl. 209—45 **5 Claims**

1. A method of separating a mixture of conductive particles and non-conductive particles including the steps of feeding said mixture onto an inclined carbon block, vibrating the block providing the block with an electrical potential of one polarity sufficient to weld, feeding these particles over a drum, rotating



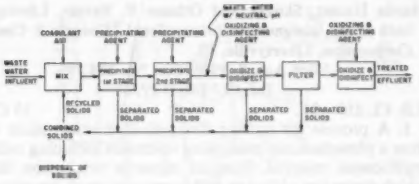
the drum, providing the drum with an opposite electrical potential, and scraping the conductive particles off of the drum at a point remote from the area of particle feeding.

4,049,545

CHEMICAL WASTE WATER TREATMENT METHOD

Peter J. Horvath, Cottage Grove, Oreg., assignor to Rocky Carvalho, Salem, Oreg.

Filed July 8, 1976, Ser. No. 703,549
Int. Cl.² C02B *1/20*
U.S. Cl. 210—28 **6 Claims**



1. A method of treating waste water, having a pH below 9.0 and containing nitrifying bacteria and in excess of 200 mg/l total solids, selected from the group consisting essentially of municipal sewage and industrial, commercial and agricultural process waters containing organic wastes and mixtures thereof, said method comprising the following sequential steps:

a. mixing an amount of said waste water with an amount of an alkaline coagulant aid effective to obtain a mixture having a pH of at least about 9 but less than 11 and thereby killing said nitrifying bacteria by means of said rise in pH level, said coagulant aid being selected from the group consisting essentially of portland cement, lime, sodium silicate and mixtures thereof;
b. adding to said mixture an acidifying precipitating agent, selected from the group consisting essentially of salts of aluminum, salts of ferric iron, copper sulfate, sulfuric acid and hydrochloric acid, and mixtures thereof, in an amount effective to lower the pH of the mixture by about 1 pH unit and thereby causing suspended solids contained in the mixture to be collected into aggregates;
c. separating said aggregated solids from said mixture;
d. adding to the resultant mixture, remaining after the separation of said aggregated solids, an acidifying precipitating agent selected from said group of precipitating agents in an amount effecting to further lower the pH of the mixture by about 1 pH unit to a pH no lower than about 6 and no higher than about 8.5, and thereby causing suspended solids contained in the mixture to be collected into further aggregates;
e. separating said further aggregated solids from the mixture;
f. adding to the resultant mixture, remaining after said multiple separations of aggregated solids, an amount of an oxidizing and disinfecting agent effective to oxidize at

least a portion of the remaining solids in the mixture and convert them to a filterable state;

g. filtering the mixture so as to separate said oxidized solids from the mixture; and

h. adding to the filtered mixtured an amount of a second oxidizing and disinfecting agent effective to lower the B.O.D. level of the mixture to below 20 mg/l.

4,049,546

DECOLORIZATION OF EFFLUENTS FROM PULP MILLS

Steven L. Rock, Ambler, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 522,653, Nov. 11, 1974, abandoned. This application Mar. 23, 1976, Ser. No. 669,563

Int. Cl.[2] B01D *15/06*

U.S. Cl. 210—30 R **9 Claims**

1. Process for removing lignin and lignin by-product color bodies from an unbleached kraft pulp mill stream which comprises passing said stream at a pH of 6–8.5 through a mass or bed of macroreticular aliphatic weak anion exchange resin possessing high pk_a value of between about 5.0 and about 10.0 in the free base form, thereby removing the lignin and lignin by-product color bodies on to the resin.

4,049,547

USE OF CHELATING AGENTS FOR ENHANCING THE SETTLING OF SLIMES

Martin Hamer, Skokie, and Othmer F. Batzer, Libertyville, both of Ill., assignors to International Minerals & Chemical Corporation, Libertyville, Ill.

Filed Apr. 8, 1976, Ser. No. 674,799

Int. Cl.[2] B01D *21/01*

U.S. Cl. 210—54 **13 Claims**

1. A process for settling finely-divided waste slime solids from a phosphate ore processing operation including colloidal argillaceous material from an aqueous suspension thereof which comprises adding to said suspension, in an amount effective to enhance the settling of said solids, at least one chelating agent of the group consisting of malic acid, tartaric acid, nitrilotriacetic acid and N,N,N^1,N^1-ethylenediaminetetraacetic acid, said amount being at least about 20 pounds per ton of suspended solids, and settling the solids from the suspension.

4,049,548

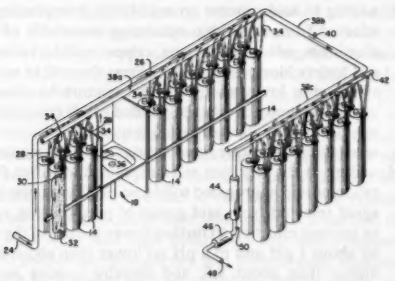
MOBILE DEMINERALIZER

Richard C. Dickerson, 1416 Rust Drive, Virginia Beach, Va. 23455

Filed May 20, 1976, Ser. No. 688,147

Int. Cl.[2] B01D *29/02;* **C02C** *1/70*

U.S. Cl. 210—96 R **12 Claims**



1. A mobile demineralizer, comprising a power driven vehicle, having a driver's area a set of primary demineralizing cylinders arranged together in an adjacent upright parallel configuration in said vehicle, a set of secondary demineralizing cylinders comprising a smaller number than said set of primary cylinders, arranged together in an adjacent upright parallel configuration in said vehicle, said primary and secondary cylinders each having a top inlet and a bottom outlet being individually detachable and containing a mixture of strong acid, strong base demineralizing resin, inlet means adapted to be connected to a source of raw water under pressure for supplying water to the inlets of said primary cylinders in parallel, a carryover pipe, means for connecting the outlets of said prmary cylinders to the inlet of said carryover pipe in parallel, intermediate probe means for producing an electrical output indicative of the concentration of ions in the water located in the carryover pipe, means for connecting the outlet of said carryover pipe to the inlets of said secondary cylinders in parallel, filter means for removing any of the demineralizing resin found in the water, means for connecting the outlets of said secondary cylinders in parallel to the input of said filter means, and discharge outlet means connected to receive the output of said filter means for providing a continuous supply of demineralized water, said continuous supply of demineralized water being maintained during removal and replacement of individual exhausted cylinders.

4,049,549

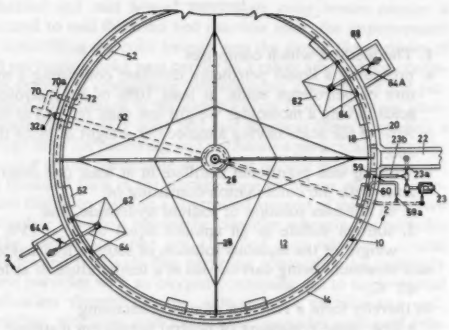
LIQUID CONDITION AND SETTLING TANKS

Richard Pierpoint Moore, Palonyra, Blackreef Road, Germiston, Transvaal, South Africa

Continuation of Ser. No. 117,017, Feb. 19, 1971, abandoned. This application June 12, 1973, Ser. No. 369,213

Int. Cl.[2] B01D *21/06*

U.S. Cl. 210—104 **7 Claims**

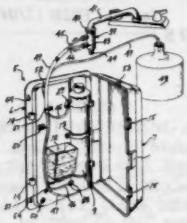


1. A liquid conditioning and settling tank comprising a base, a cylindrical wall surrounding the base, a series of spaced vanes located about the cylindrical wall and projecting radially inwardly from the wall a portion of the way up the wall, means for feeding liquid to be treated into a lower portion of the tank, means to rotate the liquid circumferentially in the tank below the vanes in a predetermined direction, and velocity reducing take-off means for removing from the tank treated liquid at the upper surface of the liquid, the vanes being inclined from the vertical in the direction of rotation of the liquid and having exposed lower edges whereby the rotating liquid impinging on the vanes is deflected downward with substantially no upward component, said means to rotate the liquid comprising an inlet projecting through the wall below the inclined vanes and directed tangentially of the wall.

4,049,550
WATER FILTRATION MODULE

Louis Obidniak, 3115 Ramezay St., Ville de Laval, Quebec, Canada

Filed Sept. 3, 1976, Ser. No. 720,349
Int. Cl.[2] B01D *35/02*
U.S. Cl. 210—152 11 Claims

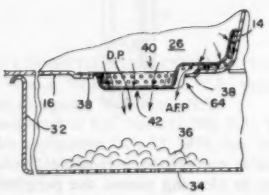


1. A water filtration apparatus for the separation of impurities from a water supply comprising a casing having a base member and a cover member hinged to said base member, a filtration module and a sterilization tank both mounted on said base member, a quick connector adapted for attachment to a raw water tap, the said connector having a raw water inlet and an outlet drain, and a valve controlling the flow of water through the said drain, a pair of hose connections, one hose connection leading from the raw water inlet of said connector to the top of the said filtration module and the other hose connection leading from the lower portion of the filtration unit to the outlet drain of the said connector, and a purified water hose connection leading from the bottom of the filtration unit, the free end thereof adapted to be directed to a purified water receiving vessel and/or to the said sterilization tank, the said sterilization tank adapted to be filled with filtered water and the said quick connector when not connected to a source of raw water is maintained under filtered water in said sterilization tank to thereby prevent the passage of air through the said hose connections to the said filtration unit and to prevent bacteria contamination.

4,049,551
SAFETY DEVICE FOR OPEN RECEPTACLE

Karl G. Otzen, Brookfield, Wis., assignor to Safety-Kleen Corporation, Elgin, Ill.

Filed Mar. 12, 1975, Ser. No. 557,884
Int. Cl.[2] B01D *35/14;* E03F *5/14*
U.S. Cl. 210—163 3 Claims

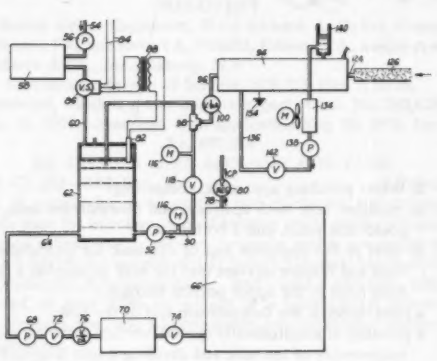


1. A safety device adapted for freely removable reception in the drain outlet opening of a liquid receptacle having a generally horizontally extending bottom wall portion, a drain outlet opening therein, and generally vertically extending side wall portions, said safety device including means for locating said device within said outlet opening, a generally horizontally extending, perforated first wall portion lying parallel to the plane of said drain outlet opening, said first wall portion providing a direct drain path from said receptacle interior, and a second wall portion cooperating with said receptacle walls to define an alternate drain flow path from said receptacle interior, said second wall portion being contoured so as to include a first part attached to and extending generally upwardly from said first wall portion, a second part lying generally parallel to said bottom receptacle wall and a third part lying generally parallel to at least one of said receptacle side walls, said second and third parts of said contoured wall including marginal portions with edges adapted to engage said bottom and side walls respectively, said contoured wall further including a plurality of openings in each of said parts thereof, said openings providing plural paths of communication between said receptacle interior and said alternate drain flow path-defining means.

4,049,552
OZONE GENERATING SYSTEM

John H. Arff, Portland, Oreg., assignor to Oregon Patent Development Company, Portland, Oreg.

Continuation-in-part of Ser. No. 508,400, Sept. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 343,790, March 22, 1973, abandoned. This application Nov. 17, 1975, Ser. No. 632,383
Int. Cl.[2] C02B *1/38*
U.S. Cl. 210—192 5 Claims



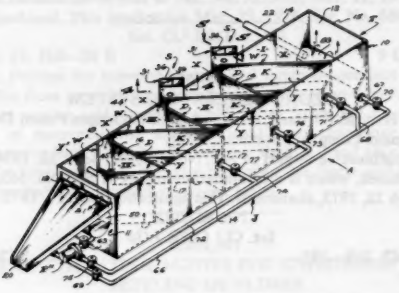
1. An ozone generating system comprising a housing having a closed interior with a removable end wall, a hollow casing in said housing including means to receive a coolant, the interior of said casing being isolated in sealed relation from the interior of said housing, a forced cooling system associated with said inner casing for circulating a coolant therethrough, at least one open-ended tubular portion extending through said inner casing, said tubular portion being formed of electrically conducting metal, at least one glass ozone generating tube having a diameter smaller than said tubular portion, an electrically conducting silver coating on the interior surface of said tube, a conductor leading into said tube for admitting high voltage into said tube, an electrically conducting band secured to said conductor and engageable with the coating around the interior of said tube, said ozone generating tube being removably supported in said tubular portion by axial movement thereof, spacer means holding said ozone generating tube centered in said tubular portion in circumferentially spaced relation thereto whereby said ozone generating tube upon a high voltage input being applied thereto operates with the metal in said tubular portion to provide ozone, the space between said ozone generating tube and said tubular portion communicating with the interior of said housing, and inlet and outlet means in said housing for receiving inlet air and discharging generated ozone, respectively.

4,049,553

WATER POLISHING MEANS FOR REMOVING OIL AND OTHER FLOTSAM FROM WATER

George B. Stebbins, 938 Fairbrook Lane, and James F. Stebbins, 2910 Shakespeare Drive, both of San Marino, Calif. 91108

Filed Apr. 12, 1976, Ser. No. 675,733
Int. Cl.[2] B03D 1/26
U.S. Cl. 210—195 R 6 Claims



1. Water polishing apparatus, comprising:

an elongate tank with upstream and downstream ends, opposed side walls, and a bottom wall;

an inlet at the upstream end of the tank for introducing a fluid and flotsam mixture into the tank to provide a mean fluid level in the upper portion thereof;

a fluid outlet at the downstream end of the tank;

a plurality of longitudinally spaced, vertical dams extending transversely of the tank and dividing it into longitudinallyspaced zones, said dams having upper, substantially horizontal edges spaced below the mean fluid level in the tank;

a vertical weir in each zone extending from one side wall to the other and dividing the zones into upstream and downstream sections, each of said weirs having an upper portion projecting above the mean fluid level in the tank, and a lower edge spaced above the bottom wall, said weir being angularily positioned relative to the longitudinal axis of the tank and converging with a side wall at an acute angle to provide a collecting corner at the upstream side of the weir for receiving flotsam;

skimming means at at least one of said collecting corners for removing flotsam from the surface of the fluid;

scavenging means at one of the collecting corners downstream of a zone containing skimming means, for removing fluid and flotsam from the fluid surface, and including at least one pipe having an open upper end beneath the upper surface of the fluid in the tank, a fluid storage container, and first pump means between said pipe and the storage container for causing a mixture of air fluid and flotsam to flow from the fluid surface to the storage container; and

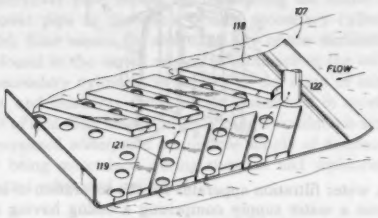
a delivery system between the storage container and at least one of the zones for transporting said mixture to said zone for dispersion therein.

4,049,554

OIL SPILL CLEANUP SYSTEM

Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 492,556, July 29, 1974, Pat. No. 3,966,614, which is a continuation of Ser. No. 292,028, Sept. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 225,987, Feb. 14, 1972, abandoned. This application Mar. 15, 1976, Ser. No. 666,854
Int. Cl.[2] E02B 15/04
U.S. Cl. 210—242 S 5 Claims



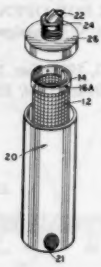
1. Apparatus for removing oil from the surface of a body of water comprising a skimming head of a single floating flexible non-absorbent perforated sheet which conforms with waves and is upturned at least at one end to permit the waves to pass thereunder and allows buoyant forces to percolate oil upward through the perforations in the sheet and flow unassisted along the upper surface of the sheet through flow directing floats to a collection region provided with means to withdraw oil from the upper surface of the sheet.

4,049,555

REUSABLE FILTER APPARATUS

Charley F. Matherne, Harvey, La., assignor to Lawrence Peska Associates, Inc., New York, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,177
Int. Cl.[2] B01D 35/00, 46/04
U.S. Cl. 210—409 2 Claims



1. Apparatus comprising a reusable flexible screen filter element and its cleaning means, the periphery of said filter element being secured to resilient frame means, said filter being resiliently windable on itself for insertion into said cleaning means, the cleaning means comprising a cylindrical container having an inlet port and an outlet port to pass a cleaning fluid through said filter and to clean said filter after which said filter may be removed and reused, removable cap means on said container for inserting and removing said filter from said container and for sealing said container after said filter is inserted therein, said inlet port comprising an opening in the top of said container, said outlet port comprising an opening in the bottom of said container, said cap comprising a removable closure fitting over said inlet port, chamber means in said closure for

holding a cleaning composition, said chamber means comprising a cylindrical side wall extending into a bottom wall having perforations therein, said chamber being placed proximate said inlet port and adapted to hold a cleaning composition for application to said screen filter element when a fluid is passed into said inlet port, through said container and out of said outlet port.

4,049,556

FOAM FIRE EXTINGUISHING AGENT

Hiroaki Tujimoto, Osaka; Tatuya Maki, Nara; Sadao Suganuma, Tokyo, and Taketora Sano, Kawasaki, all of Japan, assignors to Nippon Chemical Industrial Co., Ltd., Tokyo and Yamato Shokaki Co., Ltd., Osaka, both of Japan

Filed Jan. 20, 1976, Ser. No. 650,645

Int. Cl.[2] A62C *1/00*

U.S. Cl. 252—3 **9 Claims**

1. A foam fire extinguishing agent comprising about 0.3 to about 50% by weight of one or more alkyl acid phosphates and/or one or more salts thereof, about 0.05 to about 10% by weight of one or more amphoteric surface active agents, about 0.001 to 0.3% by weight of one or more fluorocarbon-type surface active agents, and as the balance of said agent an aqueous solution, said one or more amphoteric surfactants being selected from the group consisting of compounds represented by the formula:

$$R'-N(X')-CH_2CH_2COOM.$$

wherein R′ is an aliphatic hydrocarbon group containing 4 to 18 carbon atoms; X′ is a hydrogen atom, an aliphatic hydrocarbon group containing 1 to 18 carbon atoms or a CH_2CH_2COOM group; and M is a hydrogen atom, a sodium atom, a potassium atom, an NH_4 group, a (C_1–C_6)alkylamino group or a (C_1–C_6)alkanolamino group; and said one or more fluorocarbon-type surfactants being selected from the group consisting of C_8F_{17}–$OC_6H_4SO_3Na$, $C_8F_{17}SO_2N(C_2H_5)CH_2COOK$, $(C_2F_5)_2(CF_3)C{\cdot}CH{=}C(CF_3)SO_3NH_4$ and $[C_8F_{17}SO_2NH(CH_2)_3{\cdot}N(CH_3)_3]I$.

4,049,557

FABRIC CONDITIONING COMPOSITIONS

Harold Eugene Wixon, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 272,388, July 17, 1972, abandoned. This application Oct. 23, 1974, Ser. No. 517,577

Int. Cl.[2] D06M *9/00*

U.S. Cl. 252—8.8 **13 Claims**

1. A fabric conditioning detergent composition comprising in softening amounts a substituted alkanediamine fabric softener compound or mixture of compounds having the formula:

$$R_1-NH-(CH_2)_x-NH-R_2$$

wherein R_1 contains about 10 to 20 carbon atoms and is selected from the group consisting of 1-hydroxy methyl alkyl and 2-hydroxy alkyl, R_2 is H or R_1, and x is an integer from 2 to 12 and a detergent, said detergent being selected from the group consisting of soap, non-soap anionic detergents, and non-ionic detergents, and alkaline builder salts.

4,049,558

FREE FLOWING PHOSPHATE ESTER COMPOSITIONS FOR POST ADDITION TO DETERGENTS

Hjorth Rasmussen, Copenhagen, Denmark, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 378,882, July 13, 1973, abandoned. This application Apr. 22, 1976, Ser. No. 679,304

Claims priority, application France, July 25, 1972, 72.26687

Int. Cl.[2] C11D *1/34, 1/37, 3/12*; D06M *13/37*

U.S. Cl. 252—8.9 **4 Claims**

1. A free flowing particulate phosphate ester composition useful as an additive for particulate detergents to impart to them laundry softening properties which comprises a homogeneous mixture of 0.1 to 4 parts of $R^1O(CH_2CH_2O)_mPO(OM)_2$ wherein R^1 is a higher alkyl of 14 to 20 carbon atoms, m is from 1 to 6 and M is an alkali metal or ammonium, 0.1 to 3 parts of $[R^1O(CH_2CH_2O)_m]_2$-POOM, 0.1 to 2 parts of $R^2OPO(OM)_2$ wherein R^2 is alkyl of 6 to 10 carbon atoms and 0.1 to 1 part of $(R^2O)_2POOM$, said mixture of phosphate esters having a melting point and/or softening point lower than 45° C. and from 0.1 to 5 parts of finely divided silica, having a surface area of oven ten square meters per gram with the amount of silica present being from 5 to 100% the total amount of the mentioned phosphate esters.

4,049,559

COMPOSITION FOR SECONDARY AND TERTIARY OIL RECOVERY

Nathaniel Grier, Englewood, N.J.; Richard A. Dybas, Center Square, Pa., and Robert A. Strelitz, Edison, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 620,721, Oct. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 540,620, Jan. 13, 1975, abandoned. This application May 18, 1976, Ser. No. 687,580

Int. Cl.[2] E21B *43/22*; A01N *9/20*; A61L *13/00*

U.S. Cl. 252—8.55 D **4 Claims**

1. A premix for incorporation into displacing and driving fluids used for injection into oil-bearing strata during oil production subsequent to primary recovery which comprises at least 0.0005% by weight of 1-[1,5-di-(3,3-dimethylnorborn-2-yl)-3-pentyl]-1,5,9-triazanonane, and acid addition salts thereof, at least .05% by weight of a hydrocarbon solvent soluble surfactant, and a hydrocarbon solvent, fluid at ambient temperature.

4,049,560

DETERGENT ADDITIVES

Alan Michael Dominey, Oxford, England, assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed June 27, 1975, Ser. No. 590,852

Claims priority, application United Kingdom, July 5, 1974, 29969/74

Int. Cl.[2] C10M *1/40*

U.S. Cl. 252—33.3 **16 Claims**

1. A process for preparing an overbased magnesium detergent having a total base number of about 200 to 250, which is useful in lubricating oil, said process comprising blowing carbon dioxide into a refluxing reaction mixture until reaction substantially ceases, said reaction mixture comprising:

a. 15 to 40 wt. % of a member selected from the group consisting of: sulphurised C_9–C_{60} hydrocarbyl substituted phenol, C_6–C_{60} hydrocarbyl substituted thiophenol, and C_6–C_{60} hydrocarbyl substituted phenol or thiophenol mixed with a sufficient amount of elemental sulfur to sulfurize said phenol or thiophenol;

b. 5–15 wt. % of a member selected from the group consisting of: alkaryl sulphonic acid having a molecular weight of about 300 to 700; alkali metal and alkaline earth metal salts of said sulphonic acid, and alkali metal and alkaline earth metal sulfate salts of the reaction product of sulphuric acid with a member selected from the group con-

sisting of: cracked wax of 20 to 30 carbon atoms, C_8 to C_{25} olefin, and C_8 to C_{25} alcohol;

c. 5–15 wt. % of an alcoholic material selected from the group consisting of: ethylene glycol, diethylene glycol, C_1 to C_3 monohydric alkanol, and C_2 to C_6 alkoxy alkanol;

d. 2–15 wt. % of active magnesium oxide having a surface area of at least 80 square meters/gm;

e. at least 0.1 wt. % of a member selected from the group consisting of: C_1 to C_{18} aliphatic or aromatic, saturated or unsaturated, mono or polycarboxylic acid; anhydrides thereof; and ammonium and Group I and Group II metal salts of said C_1 to C_{18} carboxylic acids; and

f. at least 10 wt. % of a diluent oil.

4,049,561

LUBRICANT COMPOSITIONS

Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 15, 1976, Ser. No. 677,360
Int. Cl.² C10M *1/48*
U.S. Cl. 252—46.7 **9 Claims**

1. A lubricating composition comprising a major portion of lubricating oil or grease, and a minor portion, from about 0.2% to about 10% by weight of an extreme pressure additive, said additive comprising one part of (A) a partial amide derived from a C_1–C_{20} primary or secondary amine of a di- or tricarboxylic acid of from 18 to 80 carbon atoms, from 0.5 to 2 parts of (B) a thioether having a molecular weight in the range of 100 to 10,000 and a minimum sulfur content of 5% by weight, and from 0.5 to 2 parts of (C) a hydrocarbyl phosphate having a molecular weight in the range of 100 to 10,000.

4,049,562

EXTREME PRESSURE LUBRICANT COMPOSITIONS

Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 15, 1976, Ser. No. 677,331
Int. Cl.² C10M *1/26, 1/38, 1/46*
U.S. Cl. 252—46.7 **9 Claims**

1. A lubricating composition comprising a major portion of lubricating oil or grease, and a minor portion, from about 0.2% to about 10% by weight of an extreme pressure additive, said additive comprising one part of (A) a partial C_1–C_{10} alcohol ester of a di- or tricarboxylic acid of from 18 to 80 carbon atoms, from 0.5 to 2 parts of (B) a thioether having a molecular weight in the range of 100 to 10,000 and a minimum sulfur content of 5% by weight, and from 0.5 to 2 parts of (C) a hydrocarbyl phosphate having a molecular weight in the range of 100 to 10,000.

4,049,563

JET ENGINE OILS CONTAINING EXTREME PRESSURE ADDITIVE

Merwyn L. Burrous, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 371,198, June 18, 1973, abandoned. This application May 12, 1975, Ser. No. 576,405
Int. Cl.² C10M *1/20*
U.S. Cl. 252—49.9 **4 Claims**

1. A composition of matter comprising a major portion of a synthetic lubricating oil consisting of an ester of a C_4–C_{12} monocarboxylic acid and a polyol selected from pentaerythritol, dipentaerythritol, tripentaerythritol, trimethylol propane, trimethylol methane, trimethylol butane, neopentylglycol, or mixtures thereof and from 4 to 8 weight percent of a soluble methyl phenyl polysiloxane having a kinematic viscosity of 20 to 2,000 centistokes at 25° C.

4. A lubricating oil composition for jet engines consisting essentially of a major portion of a synthetic base oil consisting of mono- and di-pentaerythritol esters of C_5 to C_{10} straight and branched chain hydrocarbon monocarboxylic acid or mixtures thereof, from 4 to 8 weight percent of methyl phenyl silicone having a kinematic viscosity of 75 to 500 centistokes at 25° C, from 0.5 to 5 weight percent of a phosphate antiwear agent, from 0.5 to 5 weight percent of a secondary aryl amine antioxidant and from 0.01 to 0.5 weight percent of 1,4-dihydroxy anthraquinone a metal deactivator.

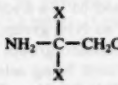
4,049,564

OXAZOLINE DERIVATIVES AS ADDITIVES USEFUL IN OLEAGINOUS COMPOSITIONS

Jack Ryer, East Brunswick; James Zielinski, Somerset; Harold N. Miller, Millington, all of N.J., and Stanley J. Brois, Wantage, England, assignors to Exxon Research & Engineering Co., Linden, N.J.

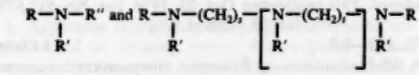
Continuation-in-part of Ser. No. 455,250, March 27, 1974, abandoned, and a continuation-in-part of Ser. No. 530,235, Dec. 6, 1974, abandoned. This application Jan. 23, 1975, Ser. No. 543,240
Int. Cl.² C10M *1/32*
U.S. Cl. 252—51.5 A **10 Claims**

1. A composition comprising a major amount of a liquid hydrocarbon of the class consisting essentially of fuels and lubricating oils and a minor but dispersing amount of a liquid hydrocarbon soluble derivative of the oxazoline reaction product of a substantially saturated aliphatic hydrocarbyl substituted C_4–C_{10} mono-unsaturated dicarboxylic acid material selected from the group consisting of acids, acid anhydrides and esters having at least about 8 carbon atoms in said hydrocarbyl group with from at least 1 to about 2 mole equivalent, per moel equivalent of said dicarboxylic acid material, of a 2,2-disubstituted-2-amino-1-alkanol having 2 to 3 hydroxy groups and containing a total of 4 to 8 carbons, and which is represented by the formula:



wherein X is an alkyl or hydroxyl alkyl group, with at least one of the X substituents being a hydroxyl alkyl group of the structure $-(CH_2)_nOH$ wherein n is 1 to 3, said reaction conditions being at a temperature of from about 140° to 240° C. for from ½ to 24 hours whereby at least one carboxylic acyl group is converted into an oxazoline ring, said reaction product being derivatized by reaction with a member of the group consisting of:

a. an aliphatic, saturated amine containing 2 to 60 carbon atoms and 1 to 12 nitrogen atoms and of the general formulae:



wherein R, R′ and R″ are independently selected from the group consisting of hydrogen; C_1 to C_{12} straight or branched chain alkyl radicals; C_1 to C_{12} alkoxy substituted C_2 to C_6 alkylene radicals; C_2 to C_{12} hydroxy or amino alkylene radicals; and C_1 to C_{12} alkylamino substituted C_2 to C_6 alkylene radicals; s is 2 to 6 and, t is 0 to 10; and,

b. a polyol selected from the group consisting of diethylene glycol, pentaerythritol, trimethylol propane, ethylene glycol, propylene glycol, glycol ethyl ether and diethylene glycol ethyl ether.

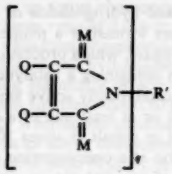
4,049,565

SUBSTITUTED MALEIMIDE LUBRICANT ADDITIVES AND LUBRICANT COMPOSITIONS MADE THEREWITH

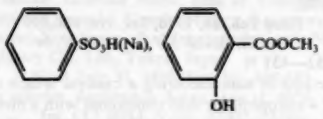
John C. Nnadi, Lagos, Nigeria, and Phillip S. Landis, Woodbury, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 31, 1975, Ser. No. 627,726
Int. Cl.[2] C10M 1/32
U.S. Cl. 252—51.5 A 18 Claims

1. A compound of the formula:



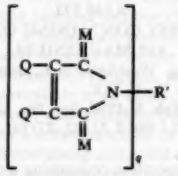
wherein Q is hydrogen or R-Ar-O wherein Ar is selected from the group consisting of phenyl, naphthyl, resorcinyl and anthryl, R is a polyalkylene group having a number average molecular weight of from 500 to 3000, only one Q being hydrogen, R′ is hydrogen, alkyl, alkylene, aminoalkylene hydroxyalkyl, hydroxyalkylene, aryl,



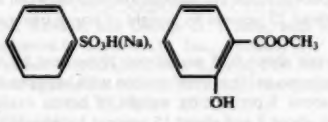
or

alkyl-substituted aryl, q is 1 or 2 and M is oxygen.

10. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or a grease thereof and a detergency amount of a compound of the formula:



wherein Q is hydrogen or R-Ar-O wherein Ar is selected from the group consisting of phenyl, naphthyl, resorcinyl and anthryl, R is a polyalkylene group having a number average molecular weight of from 500 to 3000, only one Q being hydrogen, R′ is hydrogen, alkyl, alkylene, aminoalkylene hydroxyalkyl, hydroxyalkylene, aryl,



or alkyl-substituted aryl, q is 1 or 2 and M is oxygen.

4,049,566

MAGNETIC COATING COMPOSITION

Gregorio Brilovich, and Irvin F. Masserant, both of San Jose, Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Filed June 4, 1976, Ser. No. 693,208
Int. Cl.[2] B05D 3/14, 5/12; H01F 1/00
U.S. Cl. 252—62.54 4 Claims

1. A magnetic coating composition comprising a dispersion of magnetic particles in a solution of an epoxy resin having an average of between one and three epoxy groups per molecule and having an epoxy equivalent in the range about 400 to 4,000 and containing an organic acid selected from the group consisting of formic, acetic and propionic acids in amount equal to from 2 to 20% by weight of the contained magnetic particles.

4,049,567

SILVER HALIDE ACTIVATED PHOTOCHROMIC PLASTICS

Nori Y. C. Chu, Southbridge, and Peter G. Piusz, Longmeadow, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Mar. 17, 1976, Ser. No. 667,686
Int. Cl.[2] G03C 1/02
U.S. Cl. 252—300 24 Claims

1. A photochromic plastic element comprising a plurality of photosensitive silver halide particles less than 1000 A in particle size containing activating ions which act as hole traps, said particles being dispersed within a cast, shape-retaining, light-transmissive matrix comprising at least one polymer having the ability to inhibit ripening of silver halide particles produced in solution, said matrix containing an effective amount of a plasticizer to produce an environment suitable for repetitive activations and deactivations of the silver halide particles.

4,049,568

NON-DRIPPING HEAT RESISTANT DYE PENETRANT

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 444,432, Feb. 21, 1974, Pat. No. 3,915,885, and Ser. No. 444,433, Feb. 21, 1974, Pat. No. 3,915,886, and a continuation-in-part of Ser. No. 521,730, Nov. 7, 1974, Pat. No. 3,939,092, and a continuation-in-part of Ser. No. 535,262, Dec. 23, 1974, Pat. No. 3,981,185. This application May 23, 1975, Ser. No. 580,442
The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.
Int. Cl.[2] C09K 11/06; G01N 19/08, 21/16
U.S. Cl. 252—301.19 16 Claims

1. A heat resistant biodegradable dye penetrant composition for use in non-destructive testing for detecting cracks and flaws and metallurgical conditions in the surface of an object, which comprises (1) a biodegradable nonionic surfactant selected from the group consisting of (a) straight chain, primary, aliphatic oxyalkylated alcohols, wherein said alcohols can contain from 8 to 20 carbon atoms and the oxyalkyl groups are a mixture of ethylene oxide and propylene oxide groups, and (b) ethoxylates of linear secondary aliphatic alcohols, with the hydroxyl groups randomly distributed, the linear aliphatic portion of said alcohols being a mixture of alkyl chains containing in the range from 10 to 17 carbon atoms, and containing an average of from 3 to 12 moles of ethylene oxide, (2) a small amount of dye based on said surfactant and soluble in said surfactant, said dye being present in an amount ranging from about 0.1 to 15 parts, per 100 parts, by weight of said surfactant, and (3) an amount of silica sufficient to convert said dye penetrant composition into a gel.

3. A dye penetrant composition as defined in claim 1, and said silica being powdered silica present in an amount ranging from about 1 to about 6 parts, to 1 part by volume of the sum of said surfactant and said dye.

4,049,569

PROCESS AND APPARATUS FOR PRODUCING AN INERT GAS

Johannes W. Graat, Overasselt, Netherlands, assignor to Smit Nijmegen B.V., Nymegen, Netherlands

Continuation-in-part of Ser. No. 487,424, July 10, 1974, abandoned. This application Sept. 26, 1975, Ser. No. 617,226
Claims priority, application Germany, May 17, 1974, 2424064; Sept. 26, 1974, 2445900
Int. Cl.[2] C01B *31/20*
U.S. Cl. 252—372 7 Claims

1. In a process for the production of an inert gas wherein liquid or gaseous hydrocarbons are burnt with air and the hot combustion gases are subsequently spray cooled, the improvement which comprises:

a. carrying out said burning in an elongated combustion zone surrounded by a cooling jacket;

b. spray cooling the hot combustion gases immediately after combustion in a spray cooling zone contiguous to the combustion zone which spray cooling zone is a cross-sectional continuation of the combustion zone, said spray cooling being carried out with a plurality of spray nozzles spaced around the periphery of said spray cooling zone;

c. feeding said cooling jacket with cooling water which flows therethrough to said spray cooling step; and

d. cooling and scrubbing the gases from the spray cooling zone with an aqueous medium at a temperature in the vicinity of the freezing point.

4,049,570

METHOD AND APPARATUS FOR REMOVING VAPORS AND AEROSOLS FROM GASES PRODUCED IN A GASIFICATION PLANT

Paul Gernhardt, Bochum; Wolfgang Grams, Wanne-Eickel; Siegfried Pohl, and Wilhelm Danguillier, both of Bochum, all of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Aug. 4, 1975, Ser. No. 601,266
Claims priority, application Germany, Oct. 5, 1974, 2447563
Int. Cl.[2] C01B *2/02;* C10B *49/14*
U.S. Cl. 252—373 6 Claims

1. In a process for removing vapors or aerosols from the product of high temperature gasification of solid fuel or a mixture of solid and liquid fuels wherein the fuel is fed into a gasification chamber of the type including a melting chamber therein having a slag bath at the bottom thereof, and wherein a mixture of gases and solids is discharged from the top of the gasification chamber at a temperature within the range of 800° C to 1000° C and slag is normally discharged from the bottom of the gasification chamber, the improvement comprising the steps of:

separating said mixture after discharge from the gasification chamber into a gas phase including aerosols and into a solid phase which essentially includes flue coke,

separately cooling at least down to a temperature within the range of 300° C to 100° C both the gases and the solids after separation thereof,

combining the cooled gases and the cooled solids for a period of 1 to 10 seconds within a chamber for the absorption of aerosols by the flue coke from the gases,

separating flue coke including the absorbed aerosols from the remaining gases consisting cheifly of carbon monoxide and hydrogen,

discharging said remaining gases,

returning the flue coke including the absorbed aerosols to said melting chamber for gasification of the flue coke, and

discharging aerosols together with slag from the bottom of said gasification chamber.

4,049,571

MANUFACTURE OF A CATALYST COMPOSITION CONTAINING ZINC AND NICKEL OR COBALT

Axel Nissen, Leimen; Werner Fliege, Otterstadt, and Dieter Voges, Mannhein, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 21, 1976, Ser. No. 688,763
Claims priority, application Germany, June 7, 1975, 2525506
Int. Cl.[2] B01J *31/04, 23/80*
U.S. Cl. 252—430 8 Claims

1. An improved process for the manufacture of a catalyst essentially containing nickel and/or cobalt and zinc oxide and suitable for the synthesis of ketones by aldol condensation of low molecular weight aldehydes or ketones with low molecular weight ketones and hydrogenation of the intermediate α, β-unsaturated ketones formed at a temperature above about 150° C in the liquid phase, which process comprises treating a catalyst composition containing a catalytically active amount of zinc oxide and a catalytically active amount of at least one of nickel and cobalt or at least one of a hydrogen-reducible compound of nickel or cobalt at about 50° to 160° C with a solution or suspension at a concentration of 0.1 to 50% of at least one zinc salt of an aliphatic or aromatic hydrocarbyl carboxylic acid having 2 to 20 carbon atoms.

4,049,572

CATALYST AND METHOD OF MANUFACTURE AND USE THEREOF

Walter M. Douglas, Streamwood, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 24, 1976, Ser. No. 660,899
Int. Cl.[2] B01J *31/12;* C09B *47/04*
U.S. Cl. 252—431 N 13 Claims

1. A method of manufacturing a catalyst which comprises reacting a 4-sulfophthalic acid compound with a metal salt, an ammonium donor, and a compound selected from the group of benzene-1,2-dicarboxylic acid and derivatives thereof, in aqueous solution by heating to 250° to 325° C for one-half to 10 hours.

4,049,573

ZEOLITE CATALYST CONTAINING OXIDE OF BORON OR MAGNESIUM

Warren W. Kaeding, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 5, 1976, Ser. No. 655,330
Int. Cl.[2] B01J *21/02, 27/14, 29/06*
U.S. Cl. 252—432 10 Claims

1. A catalyst composition comprising a crystalline aluminosilicate zeolite, said zeolite having a silica to alumina ratio of at least about 12, a constraint index within the approximate range of 1 to 12, and having combined therewith:

1. between about 0.25 and about 25 percent by weight of boron oxide; or

2. between about 0.25 and about 5 percent by weight of boron oxide in combination with between about 2 and about 15 percent by weight of magnesium oxide; or

3. between about 0.25 and about 10 percent by weight of phosphorus oxide in combination with between about 0.25 and about 25 percent by weight of boron oxide or magnesium oxide, or

4. between about 0.25 and about 10 percent by weight of phosphorus oxide in combination with between about 0.25 and about 5 percent by weight of boron oxide and between about 2 and about 15 percent by weight of magnesium oxide.

4,049,574

CATALYST AND PROCESS FOR PREPARING MALEIC ANHYDRIDE FROM C_4 HYDROCARBONS

Ralph O. Kerr, and Bruno J. Barone, both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 473,489, May 28, 1974, Pat. No. 3,980,585. This application Mar. 17, 1976, Ser. No. 667,624

Int. Cl.[2] B01J *27/18*

U.S. Cl. 252—437 3 Claims

1. An improved vanadium-phosphorus-oxygen catalyst complex for the oxidation of n-C_4 hydrocarbons to produce maleic anhydride consisting essentially of active components in the atom ratio, vanadium 1:phosphorus 0.90 to 1.3:copper 0.005 to 0.3:Me 0.005 to 0.25 wherein Me consists essentially of Pd and further containing as an active component an alkali or alkaline earth metal in the atom ratio of 0.001 to 0.1 per atom of V.

2. An improved vanadium-phosphorus-oxygen catalyst complex for the oxidation of n-C_4 hydrocarbons to produce maleic anhydride consisting essentially of active components in the atom ratio, vanadium 1:phosphorus 0.90 to 1.3:copper 0.005 to 0.2:Me 0.005 to 0.25 wherein Me consists essentially of Hf and further containing as an active component an alkali or alkaline earth metal in the atom ratio of 0.001 to 0.1 per atom of V.

3. An improved vanadium-phosphorus-oxygen catalyst complex for the oxidation of n-C_4 hydrocarbons to produce maleic anhydride consisting essentially of active components in the atom ratios vanadium 1:phosphorus 0.90 to 1.3:copper 0.005 to 0.3:Me 0.005 to 0.25 wherein Me consists essentially of Th.

4,049,575

PROCESS OF PRODUCING ANTIMONY-CONTAINING OXIDE CATALYSTS

Yutaka Sasaki; Akimitsu Morii, both of Yokohama; Yoshimi Nakamura, Kawasaki; Kiyoshi Moriya, Kanagawa, and Hiroshi Utsumi, Yokohama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed July 31, 1975, Ser. No. 600,683

Claims priority, application Japan, Aug. 1, 1974, 49-87539

Int. Cl.[2] B01J *21/02, 27/02, 27/16*

U.S. Cl. 252—439 22 Claims

1. A process for producing a catalyst comprising an antimony-containing oxide which comprises the steps of (A) calcining a mixture of metal oxides containing, as essential components, an oxide of antimony and an oxide of at least one metal selected from the group consisting of iron, cobalt, nickel, manganese, uranium, tin and copper, said calcining being at temperatures of from about 500° C to about 1000° C; (B) impregnating with or spraying onto said calcined mixture of metal oxides (*a*) an aqueous solution or a suspension containing (1) at least one compound of a metal selected from the group consisting of molybdenum, vanadium and tungsten, said metal compound being thermally convertible to an oxide of said metal, and (2) a tellurium compound, said tellurium compound being thermally convertible to a tellurium oxide, or (*b*) an aqueous solution or a suspension containing said metal compound (1) and an aqueous solution or a suspension containing said tellurium compound (2); (C) drying said impregnated or sprayed mixture of metal oxides; and (D) calcining said dried mixture of metal oxides at a temperature of from about 400° C to about 850° C, where said calcining (D) is at a temperature lower than said calcining (A).

4,049,576

PLATINUM-PALLADIUM CATALYST FOR SELECTIVE HYDROGENATION OF AROMATICS AND OLEFINS IN HYDROCARBON FRACTIONS

Stephen M. Kovach, and George D. Wilson, both of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 511,985, Oct. 4, 1974, Pat. No. 3,943,053. This application Nov. 3, 1975, Ser. No. 628,066

Int. Cl.[2] B01J *27/06, 23/56*

U.S. Cl. 252—441 6 Claims

4. A hydrogenation catalyst consisting of between about 0.2 and about 1.0 percent by weight each of platinum and palladium in a mole ratio of platinum to palladium of between about 1 to about 2 and about 1 to 6 and between about 1.2 to about 2.5 percent by weight of chlorine as chloride.

4,049,577

CATALYST FOR MAKING ACROLEIN

David L. Childress, Angleton; William V. Hayes, and Richard L. Poppe, both of Clute, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 15, 1975, Ser. No. 640,616

Int. Cl.[2] B01J *21/04, 23/78, 23/84, 27/20*

U.S. Cl. 252—443 9 Claims

1. An improved catalyst for the oxidation of a lower olefin containing 3 to 6 carbon atoms to the analogous unsaturated aldehyde which consists essentially of oxides of cobalt, iron, bismuth, molybdenum and potassium wherein the atomic ratios of the metals are within the ranges

$$Co_{4.5\text{-}7.0}Fe_{1\text{-}2}Bi_{1\text{-}2}Mo_{15}K_{0.05\text{-}0.2}.$$

4,049,578

HYDROCARBON CONVERSION CATALYST

William J. Reagan, Yardley, Pa., and Nai Y. Chen, R.D. Titusville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 477,240, June 7, 1974, Pat. No. 3,981,825. This application June 11, 1976, Ser. No. 695,230

Int. Cl.[2] B01J *21/04, 23/42, 23/46, 23/72*

U.S. Cl. 252—455 R 11 Claims

1. A reforming catalyst comprising a solid porous alumina support containing platinum and iridium or platinum, iridium and copper, said catalyst being prepared by the process of applying to said support a dimethylsulfoxide solution containing soluble compounds of the metals, selected from the group consisting of metal salt, metal acid, metal ammine and metal ammine halide, drying the resulting solids and calcining.

4,049,579

DEHYDROGENATION CATALYST

Harold E. Manning, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation of Ser. No. 593,725, July 7, 1975, abandoned, which is a division of Ser. No. 515,328, Oct. 16, 1974, abandoned. This application July 6, 1976, Ser. No. 702,947

Int. Cl.[2] B01J *21/02, 21/06, 21/10, 23/21*

U.S. Cl. 252—455 R 4 Claims

1. A dehydrogenation catalyst consisting essentially of (1) $MgCr_2O_4$ + silicon oxide, (2) $MgCr_2O_4$ − silicon oxide + Al_2O_3 or (3) $MgAl_xCr_{2-x}O_4$ + silicon oxide, the atomic ratio of Al:Cr being from 0.0004 to 1.2:1, x is a number of from more than 0 up to less than 1 and wherein there is 0.03 to 0.08 mol of silicon per mol of $MgCr_2O_4$.

4,049,580

METHOD FOR PRODUCING SUPPORTED RANEY NICKEL CATALYST

Laurance L. Oden; Philip E. Sanker, both of Albany, and James H. Russell, Corvallis, all of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 23, 1976, Ser. No. 707,973

Int. Cl.[2] B01J *21/04, 23/74*

U.S. Cl. 252—466 J 12 Claims

1. A process for making a Raney nickel catalyst comprising:

dipping a nickel support or substrate into a bath comprising molten aluminum;

removing the support from the bath of molten aluminum, the said support now being coated with a layer of aluminum to form a specimen;

heat treating the specimen in the absence of oxygen at a temperature of from about 700° to 1133° C; and

quenching the heat treated specimen at a temperature of from about 640° to 854° C in the absence of oxygen to form $NiAl_3$ as a solid phase coating on the substrate; and leaching the coated substrate with sodium hydroxide solution to produce a supported Raney nickel catalyst.

4,049,581

METHOD FOR PREPARING HYDROCARBON CONVERSION CATALYST USING ACID AMIDE SOLUTIONS TO IMPREGNATE A TIN COMPONENT

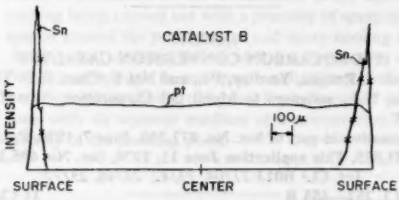
Takuji Itoh, Sayama; Eiichiroh Nishikawa, Ohi; Tadashi Miura, Ohi, and Takashi Yamahata, Ohi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1975, Ser. No. 561,930

Claims priority, application Japan, Mar. 30, 1974, 49-36404

Int. Cl.[2] B01J *23/96, 23/92;* **C10G** *35/08*

U.S. Cl. 252—466 PT **17 Claims**



1. In a method for preparing a hydrocarbon conversion catalyst comprising a refractory inorganic oxide carrier, 0.01 to 3 weight % of a Group VIII noble metal component, a tin component and 0.1 to 3 weight % of a halogen component by the procedure of impregnating said carrier with a solution or solutions containing said metal and halogen components, the improvement which comprises a step of impregnating the said carrier with a solution comprising from about 0.01 to 2 weight % of a soluble compound of tin in a solvent comprising an acid amide selected from the group consisting of primary amides, secondary amides, tertiary amides and mixtures thereof and washing and drying the impregnated carrier.

4,049,582

METHOD FOR PRODUCING A SUPPORTED CATALYST

Henry Erickson, Park Forest, and John Mooi, Hazelcrest, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 562,107, March 26, 1975, Pat. No. 3,974,255, which is a continuation of Ser. No. 340,348, March 12, 1973, abandoned. This application Mar. 25, 1976, Ser. No. 670,494

Int. Cl.[2] B01J *21/04, 23/42, 23/44*

U.S. Cl. 252—466 PT **7 Claims**

1. A method for producing a supported metal-containing catalyst comprising a first magnesium alumina spinel support, and disposed as a coating on said first magnesium aluminate spinel support, a mixture comprising second magnesium aluminate spinel and at least one catalytically active metal component sufficient to promote at least one of the following: (a) the oxidation of at least a portion of the hydrocarbon and carbon monoxide contained in the exhaust gases of an internal combustion engine and (b) the chemical reduction of at least a portion of the nitrogen oxides contained in the exhaust gases of an internal combustion engine, said metal being less basic than magnesium, which comprises:

1. forming an aqueous slurry comprising magnesium aluminate spinel precursor, and at least one compound of said metal, said precursor being derived from contacting in an aqueous medium a soluble inorganic magnesium salt and a soluble salt having aluminum in the anion to precipitate a first spinel precursor, the amount of water in said slurry being such as to allow said slurry to be applied to said support as a film of desired uniformity and thickness;
2. contacting said support with said aqueous slurry to form a coated support including a metal-containing film of desired thickness and uniformity on said support; and
3. treating said coated support at a temperature and for a time sufficient to calcine said material and form said supported metal-containing catalyst.

4,049,583

METAL OXIDE CATALYTIC COMPOSITIONS HAVING PEROVSKITE CRYSTAL STRUCTURES AND CONTAINING METALS OF THE PLATINUM GROUP

Alan Lauder, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 463,988, April 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 405,052, Oct. 10, 1973, Pat. No. 3,897,367. This application May 24, 1976, Ser. No. 689,385

The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.

Int. Cl.[2] B01J *21/04, 23/10, 23/58, 23/74*

U.S. Cl. 252—466 PT **12 Claims**

1. A compound having the perovskite-type ABO_3 crystal structure wherein

1. the sites of Type A are occupied by cations of at least two different metals each occupying at least 1% of the Type A cation sites and having an ionic radius between 0.8 and 1.65 A; and
2. from about 1% up to about 20% of the sites of Type B are occupied by ions of platinum group metals and the remaining sites of Type B are occupied by ions of non-platinum group metals having ionic radii between about 0.4 and 1.4 A.;

4,049,584

SUPPORTED RUTHENIUM CATALYST AND PROCESS FOR PREPARING IT

Oskar Weissel, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 6, 1976, Ser. No. 646,827

Claims priority, application Germany, Jan. 24, 1975, 2502894

Int. Cl.[2] B01J *23/64*

U.S. Cl. 252—470 **10 Claims**

1. A supported ruthenium catalyst comprising ruthenium supported on a support comprising an hydroxide, hydrated oxide or oxide of chromium and an hydroxide, hydrated oxide or oxide of manganese.

4,049,585

DETERGENT COMPOSITIONS CONTAINING INTERNAL VICINAL DISULFATES

David Clinton Heckert, Oxford, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

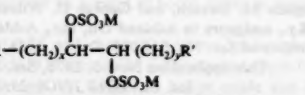
Continuation-in-part of Ser. No. 537,513, Dec. 30, 1974, abandoned, and Ser. No. 537,512, Dec. 30, 1974, abandoned. This application Dec. 11, 1975, Ser. No. 639,933

Int. Cl.[2] C11D *1/16, 3/06*

U.S. Cl. 252—531 **6 Claims**

1. An automatic dishwashing detergent composition consisting essentially of:

a. from about 3% to about 10% of an internal vicinal disulfate having the formula



wherein x and y are integers from 2 to 16 inclusive; the sum of $x + y = 10$ to 18; R is hydrogen; R′ is selected from the group

consisting of hydrogen and COOM; and wherein M is a cation selected from the group consisting of alkali metal, alkaline earth metal, ammonium and alkanolammonium cations, and

b. from about 10% to about 60% of a water soluble detergent builder salt selected from the group consisting of alkali metal polyphosphates, carbonates, bicarbonates, silicates, citrates, nitrilotriacetates and mixtures thereof.

4,049,586

BUILDER SYSTEM AND DETERGENT PRODUCT

Everett J. Collier, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 27, 1974, Ser. No. 509,865
Int. Cl.[2] C11D *3/065*
U.S. Cl. 252—532 12 Claims

1. A particulate detergent product consisting essentially of:

a. from about 0.5% to about 50% by weight of dry admixed calcium carbonate particles having a mean diameter of from about 0.01 to about 0.50 micron;

b. from about 5% to about 70% by weight of a builder selected from the group consisting of the alkali metal carbonates, bicarbonates, and sesquicarbonates and mixtures thereof;

c. from about 5% to about 70% by weight of alkali metal pyrophosphate; and

d. from about 5% to about 40% by weight of a water-soluble detergent selected from the group consisting of anionic, nonionic, zwitterionic, and ampholytic detergents and mixtures thereof.

4,049,587

LATEX FROTHING AGENT USED IN MAKING AN ELASTOMERIC LATEX FOAM

Daniel Charles Straka, Sewickley, Pa., assignor to ARCO Polymers, Inc., Philadelphia, Pa.

Filed Oct. 1, 1976, Ser. No. 728,687
Int. Cl.[2] C08J *9/30*
U.S. Cl. 260—2.5 L 2 Claims

1. In a method of preparing cellular elastomer comprising the steps of modifying an elastomer latex by adding thereto a frothing agent, whipping air into the thus modified latex to provide a froth, depositing said froth on an advancing strip to provide a froth coated strip, advancing said froth coated strip through a heated curing zone to volatilize water and steam therefrom and to provide a cellular elastomer on said strip, the improvement which consists of using as said frothing agent a latex frothing agent useful for entraining air in a froth of aqueous latex dispersion of an elastomer, said aqueous solution containing about 70% water and about 25% magnesium di(lauryl sulfate), about 2.5% polyalkoxyglycerol having about eight alkoxy groups per hydroxyl group and about 2.5% of a quatenary dihydroimidazole derivative, there being a fatty acid carbon chain attached as the only carbon-carbon linkage for the carbon between the nitrogens of the dihydroimidazole ring, the quatenary nitrogen partaking of the nature of a quatenary sodium glycinate having at such quatenary nitrogen both an alkhydroxy group and said dihydroimidazole ring, the dry surfactants of the frothing agent having a concentration which is from about 0.25% to about 1% of the dry elastomer content of the latex.

4,049,588

TREATMENT OF VULCANIZED RUBBER

Timothy Charles Philip Lee, and William Millns, both of Shrewsbury, England, assignors to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 431,623, Jan. 8, 1974. This application Dec. 9, 1975, Ser. No. 639,515
Int. Cl.[2] B29H *19/00*; B02C *7/00*
U.S. Cl. 260—2.3 19 Claims

1. A method of converting vulcanized rubber into finely-divided vulcanized rubber comprising:

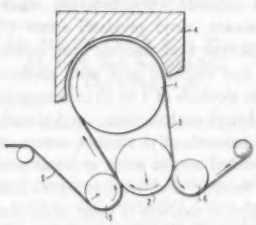
1. contacting the vulcanized rubber with a liquid effective to swell the rubber and thereby weaken it,
2. comminuting the weakened material into particles of said vulcanized rubber, at least 90% of said particles having a particle size less than 20 microns, said particles further being characterized by the property of separating out from an admixture with water,
3. removing said liquid from the comminuted material, and
4. recovering the comminuted material in the form of a fine powder.

4,049,589

POROUS FILMS OF POLYTETRAFLUOROETHYLENE AND PROCESS FOR PRODUCING SAID FILMS

Isamu Sakane, Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 452,575, March 19, 1974, abandoned. This application Sept. 30, 1975, Ser. No. 620,077
Claims priority, application Japan, Mar. 19, 1973, 48-30832; Mar. 19, 1973, 48-30833; Mar. 19, 1973, 48-30834
Int. Cl.[2] C08J *9/24*
U.S. Cl. 260—2.5 M 10 Claims



1. In a process for preparing a porous film of polytetrafluoroethylene having the steps of forming an article from an unsintered polytetrafluoroethylene mixture containing a liquid lubricant; stretching the article at least uniaxially while maintaining the temperture of the sheet during stretching at below 327° C, the absolute speed of the sheet being between 1 cm/min and 20 m/min at a stretch ratio of 10 to 100% of the initial length, and then heating the article to a temperature of at least 327° C, the improvement being in said heating step and comprising, providing a moving mirror-surface endless belt positioned over a cooling roll and a heating roll, said rolls rotating whereby each portion of said belt consecutively contacts a portion of the periphery of the heating roll and the cooling, roll, urging the stretched sheet against said endless belt at a first position thereof where said belt is in contact with said cooling roll, peeling off the sheet from said endless belt at a second position thereof where said belt is in contact with said cooling roll, said second position being downstream from said first position in the direction of movement of said belt and being separated therefrom by the path of said belt around a portion of the periphery of said heating roll, whereby said stretched sheet adhered to said belt passes over said heating roll for continuous sintering between adhering to and peeling from said endless belt.

7. A porous film of polytetrafluoroethylene produced by the process set forth in claim 1.

4,049,590

MANUFACTURE OF POLYURETHANE COMPOSITIONS

Georg Falkenstein, Neustast; Dieter Stein, Limburgerhof; Franz Haaf, Bad Duerkheim; Gerhard Heinz, Weisenheim, and Ernst Schoen, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Nov. 24, 1975, Ser. No. 634,878
Int. Cl.[2] C08G *18/04, 18/14*
U.S. Cl. 260—2.5 BE 16 Claims

1. A method for the manufacture of polyurethanes which comprises:

I. mixing

1. a polyhydroxy compound (B) having a molecular weight of from about 500 to 7000 and a hydroxyl number of from 20 to 1000 and selected from the group consisting of polyether-polyols and polyester-polyols, with

2. an aqueous polymer dispersion containing a crosslinked particulate polymer (C) having a particle size of from 500 to 5000 A and a gel content of not less than 5% and comprising homopolymers, copolymers, graft polymers or mixtures thereof, said crosslinked polymer (C) being obtained by the emulsion or suspension polymerization of

a. unsaturated compounds selected from the group consisting of styrene, α-methylstyrene, vinyl-toluene, o-, p- and m-ethylstyrene, tert.-butylstyrene, o-chlorostyrene, 2,4-dichlorostyrene, o-bromostyrene, acrylonitrile, methacrylonitrile, vinyl chloride, vinylidene chloride, vinyl bromide, vinyl acetate, vinyl propionate, vinyl pivalate, esters of acrylic acid, methacrylic acid, itaconic acid, maleic acid, fumaric acid and crotonic acid with aliphatic or cycloaliphatic alcohols of 1 to 10 carbon atoms, lauryl acrylate, lauryl methacrylate, vinyl-glycol, but-2-ene-1,4-diol, butenol, allyl alcohol, esters of acrylic acid, substituted acrylic acids, crotonic acid, fumaric acid and itaconic acid with straight-chain or branched polyhydric alcohols of mean molecular weights from 50 to 6000, in which at least one OH group of the polyhydric alcohol is not esterified, unsaturated copolymerizable polyols with mean molecular weights of from 200 to 6000, acrylamide, methacrylamide, butadiene, isoprene, piperylene and chloroprene, and

b. crosslinking agents incorporated in the polymerized form in an amount of from 0.1 to about 20% by weight and selected from the group consisting of divinylbenzene, diallyl maleate, diallyl fumarate, diallyladipate, allyl acrylate, allyl methacrylate, diacrylates and dimethacrylates of polyhydroxyalcohols and butadiene,

wherein said homopolymers and copolymers have a glass transition temperature of from 40° to 130° C and said graft polymers have two glass transition temperatures, one of from −40° to 90° C and the other of from 40° to 130° C;

II. removing the water from the mixture to produce a dispersion of 1 to 40% by weight of polymer(s) (C) in 99 to 60% by weight of polyhydroxy compound (B); and

III. reacting the resultant mixture of (B) and (C) with an organic polyisocyanate (A) to form the polyurethanes, the ratio of the NCO equivalent of polyisocyanate to radicals of said mixture (B) and (C) which are reactive with isocyanato radicals being in the range of about 0.7–1.3:1.

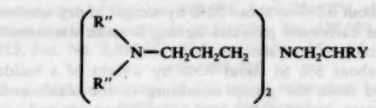
4,049,591

FOAMS AND ELASTOMERS PREPARED IN THE PRESENCE OF HIGH TERTIARY AMINE CONTENT POLYURETHANE CATALYSTS

Edward E. McEntire, and George P. Speranza, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,548
Int. Cl.[2] C08G *18/14, 18/18, 18/48*
U.S. Cl. 260—2.5 AC 8 Claims

1. A method for producing a polyurethane which comprises reacting an organic polyisocyanate with an organic polyester polyol or polyether polyol in the presence of a catalytic amount of a compound having the following structural formula:



where R″ is lower alkyl, R is hydrogen or lower alkyl and Y is selected from the group consisting of CN, $CONH_2$, CO_2R', $CONR'_2$ and COR′ where R′ is independently hydrogen, lower alkyl or aryl.

6. The method of claim 2 wherein a flexible polyether polyurethane foam is provided which comprises reacting in the presence of a blowing agent said organic polyisocyanate with a polyether polyol formed by the addition of a polyhydric alcohol having a functionality of from 2 to about 4 with an alkylene oxide of 2 to 4 carbon atoms in the presence of said catalyst, said organic polyisocyanate being employed in an amount sufficient to provide 0.4 to 1.5 mol equivalents of isocyanato groups per mol equivalent of hydroxyl groups, said polyether polyol having a molecular weight within the range of about 2000–7000.

4,049,592

BIODEGRADABLE HYDROPHILIC FOAMS AND METHOD

Nelson Samuel Marans, Silver Spring, and Alan Ricky Pollack, Bethesda, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 597,258, July 18, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,295
Int. Cl.[2] C08G *18/14*
U.S. Cl. 260—2.5 AD 6 Claims

1. A method of preparing biodegradable foam structures having three-dimensional networks, said method comprising, foaming a first component comprising isocyanate capped hydroxyester polyol having a reaction functionality of at least 2 with a second component comprising aqueous reactant wherein the H_2O Index Value is about 1,300 to 78,000, the hydroxyester linkages in said polyol formed by condensation of an aliphatic hydroxy carboxylic acid with the hydroxyl groups of (a) an essentially linear polyether, or (b) a monomeric low molecular weight aliphatic alcohol containing from 3 to 8 hydroxyl groups per mole.

4,049,593

INORGANIC SUBSTANCE COMPOSITION AND PROCESS FOR PRODUCING SAME

Hiroshi Sato; Munehiro Okumura; Fujio Itani; Shouji Fujii; Tsutomu Kakuda, and Hiroshi Nakatui, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 428,193, Dec. 26, 1973, abandoned. This application Oct. 19, 1976, Ser. No. 733,919
Claims priority, application Japan, Dec. 29, 1972, 47-1565
Int. Cl.[2] C08J 3/12
U.S. Cl. 260—2.5 E 10 Claims

1. An inorganic substance composition comprising about 95% by weight of a finely divided inorganic substance and about 5% by weight of a fiber forming organic linear high molecular weight synthetic polymeric material; said inorganic substance composition being in the form of fine fibrous-like, flake-like or sliver-like structures and having a specific surface area of at least 10 m^2/g and a porous structure containing a plurality of fine, irregular voids therein, the wall forming each void being less than 5 micron in thickness.

4,049,594

PROCESS FOR PREPARING EXPANDABLE STYRENE POLYMER PARTICLES

Toshiki Ikeda, Shiga; Fumito Yamai, Kusatsu, and Tomohiko Ishida, Shiga, all of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Oct. 29, 1975, Ser. No. 626,868
Claims priority, application Japan, Oct. 31, 1974, 49-126187
Int. Cl.[2] C08J 9/18
U.S. Cl. 260—2.5 B 8 Claims

1. In a process for preparing expandable styrene polymer particles wherein styrene polymer particles are dispersed in water in the presence of a suspending agent and an expanding agent is added to the suspension to impregnate the particles, the improvement comprising employing magnesium oxide in an amount from about 0.2 to about 1.0% by weight of the polymer particles as the suspending agent.

4,049,595

BLOCK COPOLYMER COMPOSITIONS

Richard J. G. Dominguez, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 23, 1976, Ser. No. 679,591
Int. Cl.[2] C08K 5/01; C08L 7/00
U.S. Cl. 260—5 10 Claims

1. A polymeric composition comprising:
   a. 100 parts by weight of a block copolymer having at least two monoalkenyl arene polymer end blocks A and at least one elastomeric conjugated diene mid block B, each block A having an average molecular weight between about 5,000 and about 125,000 and each block B having an average molecular weight between about 15,000 and about 250,000, said blocks A comprising 8-65% by weight of the copolymer;
   b. 5–125 parts by weight of a high impact polystyrene resin containing from about 1–35 weight percent elastomeric component, said high impact polystyrene having a weight average molecular weight of over about 70,000;
   c. 5–175 parts by weight of a hydrocarbon rubber extending oil; and
   d. 0–250 parts by weight of a finely divided filler.

4,049,596

CORROSION RESISTANT AQUEOUS AND SOLVENT-BASED PRIMER COMPOSITIONS CONTAINING SYNERGISTIC BLENDS OF ZINC BORATE AND BARIUM METABORATE PIGMENTS

Andrew Traister, Pittsburgh, and Glenn Troup, Sarver, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 3, 1975, Ser. No. 628,695
Int. Cl.[2] C09D 3/66, 3/80, 5/08
U.S. Cl. 260—18 EP 10 Claims

1. A corrosion resistant primer composition comprising:
   a. a film forming resin vehicle blend consisting essentially of:
      1. from about 60 percent to about 80 percent by weight solids of an acrylic polymer latex and from about 20 percent to about 40 percent by weight solids of an alkyd resin, styrene-allyl alcohol ester adduct or a polymerized dehydrated castor oil; or
      2. from about 85 percent to about 95 percent by weight solids of an epoxy ester resin and from about 5 to about 15 percent by weight solids of a chlorinated paraffin; and
   b. a pigment blend consisting of from 10 to 95 percent by weight of zinc borate and from 5 to 90 percent by weight of barium metaborate, wherein said zinc borate has the formula:

$$2\,ZnO \cdot 3\,B_2O_3 \cdot (H_2O)_x$$

wherein x is from 3.3 to 3.7 and wherein the ratio of said pigment blend to said resin vehicle solids is from about 40:100 to about 90:100.

4,049,597

GLASS FIBER SIZING COMPOSITION

Donald L. Motsinger, Forest City, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 513,208, Oct. 9, 1974. This application May 13, 1976, Ser. No. 685,842
Int. Cl.[2] C08J 3/20
U.S. Cl. 260—18 EP 6 Claims

1. A glass fiber sizing composition comprising a pheolic epoxy resin; the reaction product of a partial ester of a polycarboxylic acid containing 1 or more unesterified carboxyl group with a compound containing more than one epoxy group; a dual emulsifier system; one emulsifier being a polyethylene glycol, the second emulsifier consisting essentially of the reaction product of propylene glycol and ethylene oxide; a saturated fatty triglyceride; and a silane coupling agent.

4,049,598

AMINO-POLY(AMIDAZOLINE-AMIDE)

Dwight E. Peerman, Minnetonka; Dale G. Swan, St. Louis Park, and H. Gordon Kanten, Minneapolis, all of Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed July 6, 1976, Ser. No. 703,035
Int. Cl.[2] G08G 69/26
U.S. Cl. 260—18 N 9 Claims

1. An amino-poly(imidazoline-amide) having a total amine number of at least 75 and a tertiary amine number of at least 50, formed as the reaction product at a temperature and time sufficient to provide said tertiary amine number of
   a. from about 20–50 equivalent percent of azelaic acid,
   b. up to about 20 equivalent percent of another, different, aliphatic, dicarboxylic acid having from 6 to 12 carbon atoms,
   c. up to not more than 6 equivalent percent of a dimeric fat acid,
   d. up to not more than 10 equivalent percent of a monomeric, monocarboxylic fatty acid having from 16–22 carbon atoms,
   e. about 25–40 equivalent percent of diethylene triamine and
   f. about 15–30 equivalent percent of an alkylene diamine having 2–6 carbon atoms wherein the sum of said equiva-

lents percent total 100 and the sum of amine equivalents percent is at least about equal to the carboxyl equivalent percent and the equivalent percent of diethylene triamine is at least about equal to the equivalent percent of said diamine, provided further that where a mixture of said dimeric fat acid and said monomeric fatty acid is employed the total equivalent percent of said mixture shall not exceed 11 equivalent percent.

4,049,599

HIGH SOLIDS POLYESTERS CAPABLE OF DISSOLVING IN AN ORGANIC SOLVENT

Joseph C. Lott, Manchester, Mo., assignor to Grow Chemical Corporation, New York, N.Y.

Filed Jan. 9, 1976, Ser. No. 647,663
Int. Cl.[2] C09D *3/52, 3/64*
U.S. Cl. 260—22 M 7 Claims

1. A composition of matter comprising a polyester capable of dissolving in an organic solvent, having a solids content of at least 75% by weight, (on a pigment, filler and catalyst-free basis), at a viscosity of X-Z on the Garner scale, prepared by reacting an aromatic polycarboxylic acid, anhydride, or a functionally acid esterifiable derivative thereof, an aliphatic polycarboxylic acid, anhydride or a functionally acid esterifiable derivative thereof, an aliphatic polyol and a monofunctional fatty acid to an acid number less than about 10, and then reacting the product of that reaction with an aromatic or aliphatic polycarboxylic acid, anhydride or a functional acid esterifiable derivative thereof to an acid number greater than 10 and less about 60, wherein the total reactants have a hydroxyl/carboxyl ratio of greater than 1; the amount of monofunctional fatty acid employed ranges from about 20 to about 50% of the total number of acid equivalents of the reactants, and the amount of aromatic polycarboxylic acid reacted in the first step ranges from about 20% to about 50% of the total number of acid equivalents of the reactants.

5. The composition of claim 1 further comprising an organic solvent soluble cross-linkable nitrogenous composition wherein the components are present on a weight basis as:

0.5 - 5:1 Polyester:Nitrogenous Composition

4,049,600

WELDABLE CORROSION RESISTANT PRIMER MATERIAL

Kanti D. Patel, Plymouth, Mich., assignor to Mortell Company, Kankakee, Ill.

Filed July 8, 1975, Ser. No. 594,122
Int. Cl.[2] C09D *3/58, 3/66, 5/08*
U.S. Cl. 260—22 EP 11 Claims

1. A weldable, corrosion preventative primer material comprising:

a binding agent and drying time control agent selected from the group consisting of long oil alkyds, medium oil alkyds, short oil alkyds and epoxy esters;

between 15 and 39% by weight of a paraffinic oil;

between 7.2 and 16.4% by weight of pigment comprising iron oxide;

between 1.5 and 2.09% by weight of calcium oxide;

between 0.20 and 0.24% by weight of a composition of diethylene glycol and boron trifluoride;

an epoxy resin; and

a viscosity control agent.

4,049,601

MOISTURE-RESISTANT POLYURETHANE-BASED PRESSURE-SENSITIVE ADHESIVES

Ralph L. Anderson, Columbia, S.C., assignor to Anchor Continental, Inc., Columbia, S.C.

Division of Ser. No. 443,917, Feb. 19, 1974, Pat. No. 3,940,513.
This application Oct. 1, 1975, Ser. No. 618,512
Int. Cl.[2] C08L *93/00*
U.S. Cl. 260—24 9 Claims

1. A moisture-resistant, polyurethane-based, pressure-sensitive adhesive comprising a substantially uniform mixture of: (1) the reaction-product of 1.7 to 1.1 equivalents of an aromatic polyisocyanate and 1 equivalent of polyols of molecular-weight between 1500 and 5000 and hydroxyl number between 30 and 100; (2) the reaction-product of 1.7 to 1.1 equivalents of an aromatic polyisocyanate and 1 equivalent of a liquid hydroxylated elastomer of hydroxyl number between 20 and 60 in the amount of between 6 and 25 percent of the combined weight of the products of (1) and (2); (3) compatible tackifying resins in the amount of 40 to 150 percent of the combined weight of the products of (1) and (2) and selected from the class consisting of (a) the methyl, triethylene glycol and diethylene glycol esters of rosin, tall oil, hydrogenated rosin and stabilized rosin and (b) the glycerol and pentaerythritol esters of rosin, tall oil, hydrogenated and stabilized rosin; the proportions of the resins of (a) and (b) being between 10 and 40 percent of the combined weight of (a) and (b) resins; (4) active polyurethane catalyst in the amount of between 0.3 and 3 per cent of the combined weight of (1) and (2).

4,049,602

WHITE NON-PIGMENTED HOT MELT POLYOLEFIN ADHESIVES

Kenneth H. Albers, and Robert E. Holliday, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,326
Int. Cl.[2] C08L *51/06, 93/00*
U.S. Cl. 260—27 R 11 Claims

1. An adhesive composition capable of being used as a hot melt adhesive comprising a blend of styrenated amorphous polyolefin having a styrene content of about 1 to 90 percent by weight and a melt viscosity at 190° C. of at least 10 centipoise prepared by polymerizing styrene in the presence of an amorphous polyolefin having a melt viscosity at 190° C. of from about 100 to about 500,000 centipoise with a peroxide catalyst at a temperature of about 160° C. to about 300° C. and about 10 to 50 weight percent of the adhesive composition of at least one tackifying resin selected from the group consisting of hydrocarbon resins, polyterpene resins and rosin esters.

4,049,603

ADHESION OF GLASS FIBERS TO RUBBER

Otto C. Elmer, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 523,645, Nov. 13, 1974, Pat. No. 3,955,033.
This application Jan. 12, 1976, Ser. No. 648,439
Int. Cl.[2] C08L *91/06, 61/12*
U.S. Cl. 260—28.5 R 10 Claims

1. A composition of matter consisting essentially of an aqueous alkaline dispersion of 100 parts by weight of a rubbery vinyl pyridine copolymer, from about 8 to 75 parts by weight of a water soluble, heat reactable o-cresol-formaldehyde-resorcinol resin,

and from about 250 to 1100 parts by weight of water, the mol ratio of the o-cresol to the resorcinol being from about 1:1 to 1:5 and the mols of formaldehyde being in excess of the total mols of the o-cresol and resorcinol in the resin.

4,049,604

EMULSION POLYMERIZATION METHOD FOR PREPARING AQUEOUS DISPERSIONS OF ORGANIC POLYMER PARTICLES

Donald S. Morehouse, Jr., Midland, Mich., and Frank Harold Bolton, deceased, late of Ann Arbor, Mich., by Kathryn M. Bolton, administratrix, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 805,908, March 10, 1969, abandoned. This application June 8, 1970, Ser. No. 44,592
Int. Cl.[2] C08L *25/06*
U.S. Cl. 260—29.6 RW 5 Claims

1. An emulsion polymerization method for preparing an

aqueous dispersion of normally solid organic polymeric particles, said method comprising dispersing an oil phase comprising at least one monovinylidene aromatic carbocyclic monomer in an aqueous phase containing from about 0.5 to about 4 weight percent based on total monomer of a stabilizing emulsifier selected from the group consisting of water-soluble anionic surfactant, watersoluble non-ionic surfactants and mixtures thereof, and from about 0.2 to about 2 weight percent based on total monomer of a polymer of at least 20 weight percent of a sulfo ester of an α-methylene carboxylic acid and up to 80 weight percent of at least one ethylenically unsaturated monomer copolymerizable therewith selected from a group consisting of monovinylidene aromatic carbocyclic monomer, acrylate esters and acrylonitriles, said total monomer being capable of polymerization to form a water-insoluble polymer, and (2) subjecting the dispersion to emulsion polymerization conditions comprising free-radical type catalyst, temperature in the range from about 60° to about 100° C and agitation of the dispersion.

4,049,605

PROCESS FOR THE POLYMERIZATION OF ACRYLONITRILE

Toshiyuki Kobashi; Masahiko Ozaki; Kenichi Ono, and Noboru Abe, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Aug. 12, 1975, Ser. No. 604,043
Claims priority, application Japan, Aug. 13, 1974, 49-92911
Int. Cl.² C08F *20/44*
U.S. Cl. 260—29.6 AN **9 Claims**

1. A process for the catalytic polymerization of acrylonitrile or a monomer mixture containing above 75% by weight of the mixture of acrylonitrile and at least one other ethylenically unsaturated compound, characterized in that the polymerization is conducted at a temperature above 120° C. under the internal pressure generated in a closed polymerization system or under external pressure above the vapor pressure generated in the polymerization system under such polymerization conditions wherein water is present in the system in a range of 5 to 20 percent by weight based on the total weight of the monomer(s) and water to produce an acrylonitrile polymer in a substantially molten state, said polymerization being conducted in the presence of an oil-soluble radical generating agent as a catalyst whose decomposing temperature to obtain a half-life period of 10 hours is about 80° C. selected from the group consisting of di-tert-butyl diperoxyphthalate, tert-butyl hydroperoxide, di-tert-butyl peroxide, 2,5-dimethyl-2,5-di-tert-butyl peroxyhexine, 4-azobis-4-cyanopentanoic amide and 1-azobis-1-cyclohexanecarbonitrile.

4,049,606

PREPARATION OF A MANNICHED POLYACRYLAMIDE QUARTERNARIES THEREOF

Wood E. Hunter, Lombard, and Theodore P. Sieder, Sauk Village, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed July 16, 1976, Ser. No. 705,973
Int. Cl.² C08L *61/20*
U.S. Cl. 260—29.4 UA **12 Claims**

1. An improved method for the preparation of a cationically modified acrylamide polymer, said cationically modified polymers generally being prepared by admixing together:

a. an acrylamide polymer;

b. a lower aliphatic aldehyde containing 1–3 carbon atoms; and

c. a lower alkyl secondary amine containing 2–6 carbon atoms; in a mole ration of amide groups on said acrylamide polymer to *b* and *c* above of from 1.0:0.5:0.5 to 1.0:1.5:1.5, the improvement comprising:

A. Preparing a 5–40% by weight aqueous solution of a water soluble acrylamide polymer;

B. Adjusting the pH of said aqueous solution of a water soluble acrylamide polymer to between 4.5–5.5;

C. Adding to the aqueous solution of the acrylamide polymer with mixing, an aqueous solution of a water soluble lower aliphatic aldehyde containing 1–3 carbon atoms in a mole ratio of aldehyde to amide functionality present on said acrylamide polymer of 0.5:1 to 1.1:1 whereby an aqueous acrylamide-aldehyde solution is prepared;

D. Adding to said aqueous acrylamide-formaldehyde solution with mixing a lower aliphatic secondary amine containing 2–6 carbon atoms in a mole ratio of the lower aliphatic aldehyde added to said acrylamide polymer in step C to amine of 1.0:1.0 to 1.0:1.2, whereby the secondary amine is reacted with the acrylamide-aldehyde solution and a stable cationically modified acrylamide polymer is formed; and then,

E. Recovering an aqueous solution of cationically modified acrylamide polymer.

4,049,607

HEAT CONVERTIBLE COATING COMPOSITIONS

Wellington Franklyn Berghoff, Madison, Conn., assignor to ISIS Chemicals, Inc., Stamford, Conn.

Filed Aug. 18, 1972, Ser. No. 281,626
Int. Cl.² C08L *61/20*
U.S. Cl. 260—29.4 UA **7 Claims**

1. A heat convertible coating composition consisting essentially of water and, as the essential film-forming polymer ingredient in solution in said water, a partially neutralized water soluble tertiary alkanol amine salt of a copolymer, dissolved in a sufficient amount of solvent, to dissolve said salt, said alkanol amine being selected from the group consisting of dimethyl amino ethanol, triethanolamine, dimethyl aminopropanol, tripropanol amine and diethylamino ethanol, said copolymer consisting of C_2–C_8 alkyl acrylate and 8 – 15% acrylic acid with from 0 – 5% acrylamide and 5 – 10% of hydroxethyl acrylate or hydroxypropyl acrylate and having a molecular weight of 20,000 to 200,000 and an acid number of 95 – 120, said partially neutralized tertiary alkanol amine salt having from 61 – 65% of the stoichiometric amount of tertiary alkanol amine required for complete neutralization of all of the carboxyl groups of said copolymer, said solvent for said 61 – 65% neutralized copolymer salt solution selected from the group consisting of ethylene glycol monoethyl ether, ethylene glycol monoethyl ether acetate, ethylene glycol monobutyl ether butanol and mixtures of these, and a cross-linking, water-soluble and alcohol-soluble film-forming aminoplast selected from the group consisting of melamine-formaldehyde resin condensate, urea-formaldehyde resin condensate, guamidine-formaldehyde resin condensate and the methanol and ethanol modified forms of the aforesaid condensates, and wherein all but the alcohol or ester solvent in the volatile phase is water.

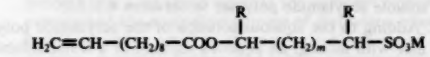
4,049,608

FUNCTIONAL MONOMERS AND COPOLYMERS THEREOF

Robert Steckler, Crofton; Fred Robinson, Columbia, and Robert F. Farmer, III, Gaithersburg, all of Md., assignors to Alcolac Inc., Baltimore, Md.

Division of Ser. No. 498,090, Aug. 16, 1974, abandoned. This application July 19, 1976, Ser. No. 706,206
Int. Cl.² C08L *33/14*
U.S. Cl. 260—29.6 SQ **4 Claims**

1. In an aqueous emulsion polymerization process wherein an ethylenically unsaturated monomer is copolymerized in an aqueous emulsion containing a copolymerizable surfactant as a stabilizer for the thus obtained latex; the improvement which comprises, employing as said copolymerizable surfactant an ester of undecylenic acid with a hydroxyalkane sulfonic acid, said ester having the formula:

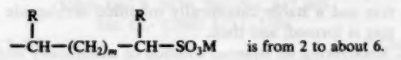


wherein:

R represents a member of the group consisting of hydrogen, methyl and ethyl;

M represents a cation selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, ammonium and amino; and

m represents an integer of from 0 to 4, provided however that the total number of carbon atoms in the group:



is from 2 to about 6.

4,049,609

PROCESS FOR MODIFYING UNSATURATED POLYESTER SYSTEMS

Juan E. Aguirre, Hackensack, N.J., assignor to Sintetica Americana, Inc., Hackensack, N.J.

Continuation-in-part of Ser. No. 518,071, Oct. 25, 1974, abandoned. This application Nov. 12, 1975, Ser. No. 630,975

Int. Cl.[2] C08L *63/12, 67/06*

U.S. Cl. 260—29.6 NR **18 Claims**

1. A process for modifying an unsaturated polyester resin system to provide a curable, stable water-in-oil emulsion system, comprising:

reacting said polyester resin system with a hydrolized source of hypochlorite ion, while maintaining during the duration of said reaction a pH of at least 4, whereby said reaction is predominantly one of chlorohydration to yield said curable emulsified system; said source of hypochlorite ion being an aqueous solution having an available chlorine content in the range of from 2.5 to 15%, which is added to said polyester resin system in quantities such that the original resin system comprises about 15 to 70% by weight of the resultant modified system.

4,049,610

PIGMENT PREPARATIONS

Wilhelm Bunge; Wolf-Dieter Last; Rudolf Saitner, and Karlheinz Wolf, all of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 543,118, Jan. 22, 1975 abandoned. This application Jan. 19, 1976, Ser. No. 650,466

Claims priority, application Germany, Jan. 22, 1974, 2402839

Int. Cl.[2] C08F *45/36*

U.S. Cl. 260—31.2 N **11 Claims**

1. Process for the pigmentation of a synthetic macromolecular material comprising incorporating into said macromolecular material a pigment preparation comprising an inorganic or organic pigment in the amount of from 3 to 80% by weight of said preparation, a carbodiimide resin pigment vehicle in the amount of from 0.5 to 85% by weight of said preparation, and an organic solvent free from amino groups in the amount of from 0 to 75% by weight of said preparation, wherein additional functional groups on said carbodiimide resin comprise urethane, ester, ether or hydroxyl groups or a combination thereof.

4,049,611

MODIFIED POLYESTER POLYBLENDS AND PREPARATION THEREOF

John William Hirzy, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 19, 1975, Ser. No. 633,207

Int. Cl.[2] C07C *69/34;* **C08K** *5/11, 5/12*

U.S. Cl. 260—31.6 **31 Claims**

1. Polyblend comprising (a) an alcohol terminated polyester, (b) a coupled polyester derived from a partially alcohol terminated polyester, and (c) a coupled polyester derived from a non-terminated polyester, said polyblend having a molecular weight below about 12,000 and containing from about 10 percent to about 40 percent (b) and (c) combined.

4,049,612

METAL PHOSPHINATES AS SMOKE RETARDANTS FOR POLYVINYL HALIDES

Stanley R. Sandler, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 28, 1975, Ser. No. 636,175

Int. Cl.[2] C08J *3/20*

U.S. Cl. 260—31.8 R **11 Claims**

9. A process of preparing a smoke retardant polyvinyl halide resin comprising mixing a polyvinyl halide resin with a sufficient amount to reduce smoking of a metal phosphinate having one, two, three or four phosphinate groups per coordination center and selected from the respective formulae:

a. MX, MaX, Ma_2X, Ma_3X, $M(AA)X$, $M(AA)_2X$,

b. MX_2, MaX_2, Ma_2X_2, $MabX_2$, $M(AA)X_2$,

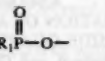
c. MX_3, MaX_3, Ma_2X_3, $MabX_3$, $M(AA)X_3$ or

d. MX_4

wherein

M is a metal selected from the group consisting of beryllium, magnesium, calcium, strontium, barium, titanium, zirconium, antimony, bismuth, chromium, molybdenum, tungsten, manganese, iron, ruthenium, cobalt, rhodium, iridium, nickel, palladium, platinum, copper, silver, zinc, cadmium, mercury, aluminum, tin, lead and mixtures thereof.

X is a phosphinate group having the structure



wherein

R and R_1 are independently selected from the group consisting of an aliphatic group of 1 to 20 carbons, a cycloaliphatic group of 3 to 20 carbons, an aromatic group of 6 to 12 carbons and said aliphatic, cycloaliphatic or aromatic group can have a substituted group thereon the substituted group being selected from the class consisting of a halogen, ether, hydroxyl, alkoxyl, ketone and ester; R can also be hydrogen;

a and *b* are independent unidentate groups selected from the clas consisting of oxy, alkoxy, hydroxyl and halide; and

AA is a bidentate ligand selected from the group consisting of acetylacetonate, picolinate, 8-hydroxyquinolinate, dimethyl glyoximate and glycinate.

10. The process of claim **9** wherein the polyvinyl halide resin contains a plasticizer.

4,049,613

POLYETHERIMIDE COMPOSITES

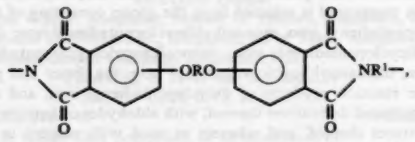
Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 7, 1976, Ser. No. 720,583
Int. Cl.[2] C08L 79/08
U.S. Cl. 260—37 N 4 Claims

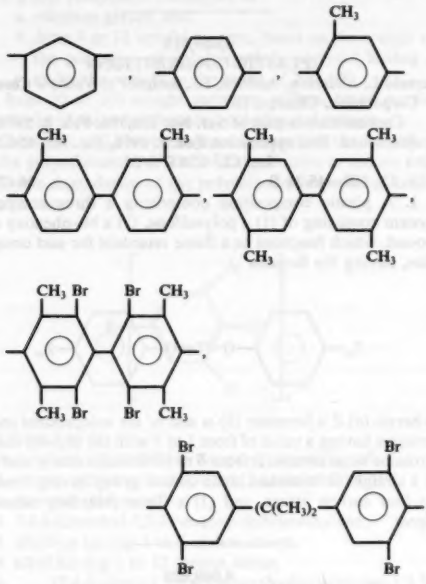
1. Polyetherimie-carbon fiber composites comprising,

A. from 40% to 85% by weight of carbon fiber having a tensile strength of at least 100,000 psi at 25° C, and an elastic modulus of at least 2×10^6 psi at 25° C and,

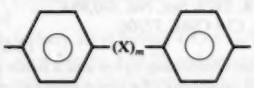
B. from 15% to 60% by weight of polyetherimide, having terminal nitro aromatic groups, consisting essentially of chemically combined units of the formula,



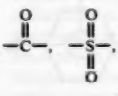
where R is selected from the class consisting of,



and (b) divalent organic radicals of the general formula,



where X is a member selected from the class consisting of divalent radicals of the formulas, C_yH_{2y}—,



—O—, and —S—, where *m* is 0 or 1, *y* is a whole number from 1-5, and R^1 is a monovalent organo radical selecred from the class consisting of C(1-8) alkyl radicals, and organic radicals having from 6-20 carbon atoms, selected from the class consisting of aromatic hydrocarbon radicals and halogenated derivatives thereof.

4,049,614

PIGMENTED POLYCARBONATES

Arthur L. Baron, and John V. Bailey, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 623,694, Oct. 20, 1975, abandoned.
This application Oct. 22, 1976, Ser. No. 734,949
Int. Cl.[2] C08K 3/36
U.S. Cl. 260—37 PC 8 Claims

1. A method for improving the surface properties of articles molded from a pigmented polycarbonate in molds having radical contours and fine interstices, the improvement comprising blending 0.01 to 3% by weight of silica having a particle size between about 1 and 50 millicrons into a polycarbonate resin containing sufficient pigment to opacify said polycarbonate resin when molded into an article.

4,049,615

PROCESS FOR THE DISTORTION-FREE COLORATION OF POLYOLEFINS WITH ORGANIC PIGMENTS

Anton Elsener, Birsfelden; Hans Harald Gehrt, Therwil; Bernhard Medinger, Aesch, and Volkhard Wiese, Pratteln, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 489,222, July 17, 1974, abandoned.
This application Feb. 19, 1976, Ser. No. 659,440
Claims priority, application Switzerland, July 30, 1973, 11052/73
Int. Cl.[2] C08K 9/04
U.S. Cl. 260—39 P 4 Claims

1. In the process for preparing shaped, distortion-free dope colored high density polyethylene or polypropylene with organic pigments, the improvement comprising using an organic pigment which is coated with a cured melamine-formaldehyde resin.

4,049,616

PREPARATION OF GRAFT, BLOCK AND CROSSLINKED UNSATURATED POLYMERS AND COPOLYMERS BY OLEFIN METATHESIS

Kenneth W. Scott, Cuyahoga Falls, and Nissim Calderon, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 524,730, Nov. 18, 1974, Pat. No. 4,010,224, which is a division of Ser. No. 435,405, Jan. 21, 1974, abandoned, which is a division of Ser. No. 259,881, June 5, 1972, Pat. No. 3,891,816, which is a division of Ser. No. 882,270, Dec. 4, 1969, Pat. No. 3,692,872. This application Oct. 26, 1976, Ser. No. 735,237
Int. Cl.[2] C08K 3/04; C08L 23/00
U.S. Cl. 260—42.32 3 Claims

1. A crosslinking reaction wherein a mixture consisting

A. a multicyclic multiolefin crosslinking comonomer possessing at least two interconnected unsaturated alicyclic rings that contain 4, 5, 7, 8, 9, 10 and 12 carbon atoms, and each of said rings possesses at least one —CH=CH— grouping, and said multicyclic multiolefin being free of non-aromatic conjugation; and

B. at least one alicyclic unsaturated compound selected from the group consisting of:

1. alicyclic compounds corresponding to the formula:

wherein:

a. Q is a fragment which comprises a sequence of at least 6 carbon atoms situated in linear succession between the methylidene carbons which constitute the double bond;

b. the carbon atoms in the linear succession of Q may be interconnected by both carbon-carbon single bonds and carbon-carbon double bonds;

c. any of the carbon atoms in the linear succession of Q may be substituted by at least one member from the group of alkyl, aryl, alkenyl, aralkyl, alkaryl, cycloalkyl, cycloalkenyl, bicycloalkyl and bicycloalkenyl radicals;

d. any of said carbon atoms in the linear succession of Q may be constituents of aromatic rings and alicyclic rings; and

e. said alicyclic unsaturated hydrocarbon contains no conjugated double bonds; and

2. alicyclic compounds corresponding to the formula:

wherein:

a. P is a fragment which comprises a sequence of at least 2 and not more than 3 carbon atoms situated in linear succession between and methylidene carbons which constitute the double bond;

b. the carbon atoms in linear succession of P are connected by carbon to carbon single bonds;

c. any of the carbons in the linear succession of P may be substituted by at least one substituent member from the group of alkyl, aryl, alkenyl, aralkyl, alkaryl, cycloalkyl, cycloalkenyl, bicycloalkyl and bicycloalkenyl radicals;

d. any of said carbons in linear succession of P may be constituents of aromatic rings and alicyclic rings, and

e. said alicyclic unsaturated hydrocarbon compound contains no conjugated double bonds

is exposed to a catalyst capable of inducing ring-opening polymerization and olefin metathesis reaction, said catalyst which will convert 2-pentene into 2-butene and 3-hexene at temperatures lower than about 100° C., leading to a predominantly crosslinked polymeric substance, said process being carried out in the presence of (a) carbon black filler, (b) antioxidant, and (c) extending oil.

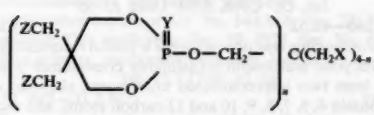
4,049,617

REACTIVE FLAME RETARDANTS

James A. Albright, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jan. 19, 1976, Ser. No. 650,172
Int. Cl.² C08K *5/51, 5/52*
U.S. Cl. 260—45.8 R **13 Claims**

1. A compound of the formula:



wherein each Z is independently selected from the group consisting of hydrogen and halogen; wherein each X is independently selected from the group consisting of hydrogen, halogen, and hydroxyl, provided that at least one X is hydroxy; wherein Y is selected from the group consisting of oxygen and sulfur; and wherein *n* is an integer from 1 to 3.

7. A polymeric composition comprising a polymer selected from the group consisting of polyurethane and polystyrene polymers and a flame retarding amount of a compound according to claim **1.**

4,049,618

POLYVINYL CHLORIDE COMPOSITION CONTAINING FERROCENE SMOKE SUPPRESSANT ADDITIVES

John J. Kracklauer, Boulder, Colo., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 227,254, Feb. 17, 1972, abandoned. This application Sept. 5, 1974, Ser. No. 486,717
Int. Cl.² C08J *3/20*
U.S. Cl. 260—45.75 P **8 Claims**

1. A polyvinyl chloride plastic containing as a smoke suppression additive a dicyclopentadienyl iron compound incorporated in said plastic in chemically uncombined form and in smoke reducing effective amounts of about from 0.1 to about 1.0%, by weight, based on the polyvinyl chloride polymer content of said plastic, and wherein said dicyclopentadienyl iron compound is selected from the group consisting of dicyclopentadienyl iron, monoalkyldicyclopentadienyl iron; dialkyldicyclopentadienyl iron, monoalkanoyldicyclopentadienyl iron; dialkanoyldicyclopentadienyl iron; the dimer and polymer reaction products of dicyclopentadienyl iron, and alkyl substituted derivatives thereof, with aldehydes or ketones; and mixtures thereof, and wherein as used with respect to said dicyclopentadienyl iron compounds, the terms alkyl and alkanoyl refer to alkyl groups and alkanoyl groups having from one to eight carbon atoms.

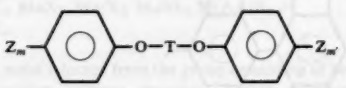
4,049,619

PLASTIC COMPOSITIONS

Arnold L. Anderson, Antioch, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 330,796, Feb. 8, 1973, abandoned. This application Feb. 9, 1976, Ser. No. 656,223
Int. Cl.² C08K *5/05*
U.S. Cl. 260—45.75 B **26 Claims**

1. A plastic composition comprising a three component system consisting of (1) a polysulfone, (2) a bis-phenoxy compound, which functions as a flame retardant for said composition, having the formula



wherein (*a*) Z is bromine; (*b*) *m* and *m'* are independent and are integers having a value of from 1 to 5 with the proviso that the bromine atom content is from 6 to 10 bromine atoms; and (*c*) T is a straight or branched chain carbon group having from one to four carbon atoms, and (3) a flame retardant enhancing agent.

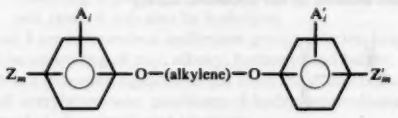
4,049,620

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 8, 1973, Ser. No. 330,853
Int. Cl.² C08L *77/06*
U.S. Cl. 260—45.75 R **15 Claims**

1. A plastic composition comprising nylon and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; m is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a

value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

4,049,621

TEXTILE FIBER

Russell Gilkey, Kingsport; Samuel D. Hilbert, Jonesboro, and Thomas H. Wicker, Jr., Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 8, 1975, Ser. No. 603,224
Int. Cl.[2] C08K *5/11, 5/13, 5/35*
U.S. Cl. 260—40 **4 Claims**

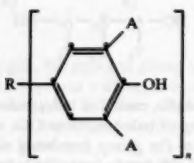
1. A textile fiber comprised of an admixture of

A. a polyetherester of

1. terephthalic acid, and
2. a diol component comprised of
   a. ethylene glycol, and
   b. from 6 to 12 weight percent, based on the weight of the polyester, of poly(oxyethylene)glycol having a molecular weight in the range of 200–600,

B. from 50 to 200 weight parts per million, based on the weight of the polyetherester, cobaltous aluminate,

C. from 0.01 to 0.16 weight percent, based on the weight of the polyetherester, of a stabilizer effective to reduce oxidative degradation of the polyester corresponding to the structure



n is from 1 to 4,

R is a radical selected from the group consisting of

1. neopentanetetrayltetrakis[oxy(3-oxotrimethylene)],
2. phosphinylidynetrioxy,
3. 2,4,6-trimethyl-1,3,5-benzenetriyltrimethylene,
4. alkylene having 1 to 5 carbon atoms,
5. alkyl having 1 to 12 carbon atoms,
6. (2,4,6-trioxo-1,2,3,4,5,6-hexahydro-s-triazine-1,3,5-triyl)tris(3-oxotrimethylene),
7. [3-octadecyloxy)-3-oxopropyl], and

A is a monovalent radical selected from the group consisting of

1. tertiary alkyl having 4 to 8 carbon atoms,
2. alkyl having 8 to 22 carbon atoms, and
3. secondary alkyl having 12 to 24 carbon atoms, and

D. a whitening agent which is

1. from 0.5 to 4.0 weight parts per million, based on the weight of the polyetherester, of a thermally stable, organic compound characterized by having a high reflectance in the range of 400 to 500 nm and strong absorbance in the range of 550 to 650 nm, or
2. from 100 to 400 weight parts per million, based on the weight of the polyetherester, of a thermally stable, organic compound having a fluorescence emission spectrum in methylene chloride in the range of 425 to 445 nm.

4,049,622

SELF-EXTINGUISHING THERMOPLASTIC MOLDING COMPOSITIONS

Helmut Fleig, Mannheim; Helmut Hagen, Frankenthal; Herbert Naarmann, Wattenheim, and Klaus Penzien, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 18, 1976, Ser. No. 715,640
Claims priority, application Germany, Oct. 9, 1975, 2545223
Int. Cl.[2] C08J *9/00*; C08K *5/46*
U.S. Cl. 260—2.5 HB **7 Claims**

1. A thermoplastic molding composition comprising a styrene homopolymer or a styrene copolymer containing a flameproofing amount of an organic bromine compound of the general formula

where X is a divalent aliphatic aromatic, cycloaliphatic or araliphatic radical of up to 12 carbon atoms and *n* is 0 or 1.

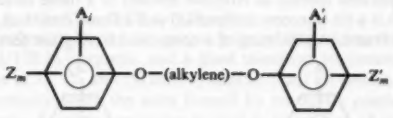
4,049,623

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 8, 1973, Ser. No. 330,803
Int. Cl.[2] C08L *63/00*
U.S. Cl. 260—45.95 G **14 Claims**

1. A plastic composition comprising epoxy resins and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

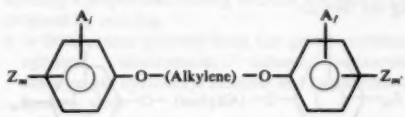
4,049,624

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 8, 1973, Ser. No. 330,806
The portion of the term of this patent subsequent to Sept. 20, 1994, has been disclaimed.
Int. Cl.[2] C08L *25/04*
U.S. Cl. 260—45.95 G **14 Claims**

1. A plastic composition comprising polystyrenes and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

4,049,625

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

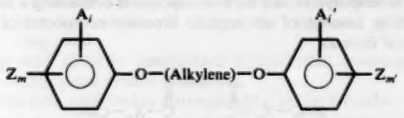
Filed Feb. 8, 1973, Ser. No. 330,807

The portion of the term of this patent subsequent to Sept. 20, 1994, has been disclaimed.

Int. Cl.[2] C08L 75/04

U.S. Cl. 260—45.95 G 14 Claims

1. A plastic composition comprising polyurethanes and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

4,049,626

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

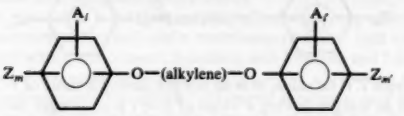
Filed Feb. 8, 1973, Ser. No. 330.851

The portion of the term of this patent subsequent to Sept. 20, 1994, has been disclaimed.

Int. Cl.[2] C08L 69/00

U.S. Cl. 260—45.95 G 14 Claims

1. A plastic composition comprising polycarbonate (having incorporated therein an effective amount of a flame retardant which is a bis-phenoxy compound) and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

4,049,627

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

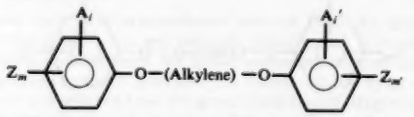
Filed Feb. 8, 1973, Ser. No. 330,852

The portion of the term of this patent subsequent to Sept. 20, 1994, has been disclaimed.

Int. Cl.[2] C08L 81/06

U.S. Cl. 260—45.95 G 14 Claims

1. A plastic composition comprising polysulfones and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

4,049,628

POLYESTERS AND PROCESS FOR THEIR PREPARATION

Jean Weiss, Moval, and Alain Zalmanski, Chantilly, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Feb. 6, 1973, Ser. No. 330,117

Claims priority, application France, Jan. 12, 1972, 72.00903

Int. Cl.[2] C08G 63/54

U.S. Cl. 260—47 UA 1 Claim

1. Unsaturated polyesters comprising the reaction product of maleic acid with the polyhalogenated polyphenyl which is itself a reaction product of decachlorodiphenyl with a polyethyleneglycol, the polyesters possessing about 60 to 98% fumaric acid groups and from about 40 to 2% maleic acid groups.

4,049,629

SOLUTION POLYCONDENSATION METHOD

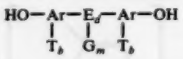
Joseph A. Pawlak, Cheektowaga; Anthony L. Lemper, Amherst, and Victor A. Pattison, Clarence Center, all of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,644

Int. Cl.[2] C08G 63/22, 63/18

U.S. Cl. 260—47 C 8 Claims

1. In the solution polymerization process for the preparation of linear aromatic polyesters by reacting an organic diacid halide with a hydroxyl containing component in the presence of a catalyst, the improvement which comprises adding a hydroxyl-containing component comprising a mixture of a bisphenol and a glycol, to the diacid halide wherein the diacid halide is terephthaloyl chloride, isophthaloyl chloride or a mixture thereof, and wherein the hydroxyl-containing component is 15–85 85 mol percent of a glycol of 2–20 carbon atoms and a bisphenol of the formula



in which Ar is aromatic, each T is independently selected from the group consisting of halogen, G or OG, each G is independently selected from the group consisting of alkyl, aryl, haloaryl, haloalkylaryl, alkylaryl, cycloalkyl, halocycloalkyl, and haloalkyl, E is a bivalent alkylene, haloalkylene, cycloalkylene, halocycloalkylene, arylene, haloarylene, —O—, —S—, —SO—, $—SO_2—$, $—SO_3—$, —CO—,

or GN<, *m* is 0 to the number of replaceable hydrogen atoms on E, each *b* is 0 to the number of replaceable hydrogen atoms on Ar, and *d* is 0 or 1.

4,049,630

PROCESS FOR PREPARATION OF S-TRIAZINE PREPOLYMERS

Rudolf Sundermann, Leverkusen; Rolf Pütter, Dusseldorf, and Ernst Grigat, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 13, 1975, Ser. No. 631,560

Claims priority, application Germany, Dec. 3, 1974, 2457081

Int. Cl.[2] C08G 73/06

U.S. Cl. 260—47 R 21 Claims

1. Process for the preparation of s-triazine prepolymers which comprises

a. condensing a hydroxy compound which has 2 or more alcoholic hydroxyl groups corresponding to the formula

$$HO—A—(OH)_z \quad (I)$$

in which

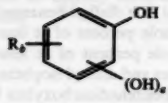
A denotes an aliphatic, cycloaliphatic or aromatic radical and

z denotes an integer which is smaller by at least the number 1 than the number of carbon atoms of the radical A which are capable of substitution

with more than 1/3 mol of cyanuric chloride per hydroxyl group at a temperature in the range of 0° to 250° C;

b. condensing the resulting condensation product with an aromatic hydroxy compound selected from the group consisting of compounds corresponding to the formulae

(II)

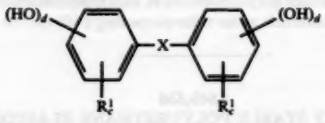


in which

R denotes hydrogen, halogen, alkyl or phenyl, and it is not necessary for several radicals R to be identical, or two radicals R which are substituents on adjacent carbon atoms can also form, conjointly with these, a carbocyclic or heterocyclic 5-membered or 6-membered ring,

a represents one of the numbers 1, 2, or 3 and *b* represents 5-*a* and

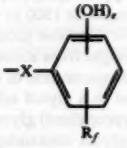
(III)



in which

X represents oxygen, the sulfonyl group (SO_2), the carbonyl group (CO), a CH_2 chain with up to 6 carbon atoms which is optionally substituted by lower alkyl radicals, phenyl, a cycloaliphatic or aromatic 5-membered or 6-membered ring or a single bond and

R^1 has the meaning indicated above for R or represents the grouping



in which

X and R have the abovementioned meaning,

e represents one of the numbers 1, 2, or 3,

f represents 5-*e*,

c represents 5-*d*,

d denotes one of the numbers 1, 2, or 3 in such a way that more than 1 hydroxyl group equivalent of the aromatic hydroxy compound is used per unconverted chlorine atom of the condensation product obtained from (a) at a temperature in the range of 0° to 250° C; and

c. thereafter reacting the free hydroxyl groups of the condensation product obtained from (b) with cyanogen halide and in the presence of a base selectd from the group consisting of alkali metal hydroxide, alkali metal carbonate, alcoholate and tertiary amine in amounts which correspond to a molar ratio of phenolic hydroxyl groups to cyanogen halide to base in the range of 1:1:1 to a slight excess of cyanogen halide at a temperature in the range of −40° to +65° C.

4,049,631

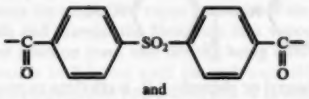
ISOPHTHALIC ACID/P,P-SULFONYLDIBENZOIC ACID/ETHYLENE GLYCOL/NEOPENTYL GLYCOL POLYESTER COMPOSITIONS AND CONTAINERS MADE THEREFROM

Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 22, 1975, Ser. No. 643,283
Int. Cl.² C08G *63/68*
U.S. Cl. 260—75 S **4 Claims**

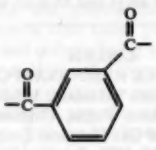
1. A linear copolyester which can be melted and molded to a clear container, the repeating units of said polyester consisting essentially of

(a)



and

(b)



and

c. —O—CH_2—CH_2—O—

and

d. —O—CH_2—$C(CH_3)_2$—CH_2—O—,

said polyester having an oxygen permeability of less than 15 cc.ml/100 in.².day.atm. and a glass transition temperature in excess of 72° C., said (a) and (b) units and said (c) and (d) units respectively being the units formed by reactively combining polyester forming precursors thereof in an amount of at least one mole of the precursors of said (c) and (d) units per mole of precursors of said (a) and (b) units and wherein the precursors of said units in forming said polyester by said reactive combining are in a molar ratio of said (b) unit precursor to said (a) unit precursor of about 80:20 to about 20:80 and a molar ratio of said (c) unit precursor to said (d) unit precursor of about 80:20.

4,049,632

CHAIN EXTENDING POLYURETHANES WITH A LARGE EXCESS OF WATER

Alan B. Magnusson, and Howard S. White, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed July 14, 1976, Ser. No. 705,117
Int. Cl.² C08G *18/10, 18/30, 18/82*
U.S. Cl. 260—75 NE **6 Claims**

1. A method of producing a polyurethane-urea elastomer resistant to textile fiber dressing solvents which comprises the steps of:

a. reacting a prepolymer having terminal isocyanate groups obtained by reacting

1. a diisocyanate selected from the group consisting of xylylene diisocyanate, toluene diisocyanate, diisocyanato cyclohexyl methane and isophorone diisocyanate; with

2. a difunctional, hydroxy-terminated polyester of equivalent weight 480–540,

without solvent, in a low-intensity mixer with:

b. water,

wherein the quantity of said water is 3–20 times greater than necessary to react with said terminal isocyanate groups.

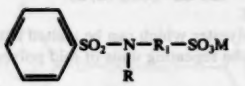
4,049,633

METHOD FOR IMPROVING DISPERSE DYEABILITY OF POLYESTERS AND PRODUCT THEREOF

Harold Roy Penton, Jr., Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

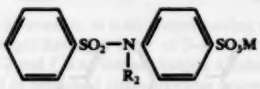
Filed Sept. 22, 1976, Ser. No. 725,909
Int. Cl.[2] C08G 63/70, 63/18
U.S. Cl. 260—75 T 12 Claims

1. A method for improving the disperse dyeability of a film or fiber forming polyester which comprises dispersing in the polyester a compound of the formula



(1)

or



(2)

wherein R is benzyl or phenethyl, R_1 is ethylene or propylene, R_2 is hydrogen or lower alkyl and M is an alkali metal.

4,049,634

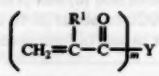
IN-AIR CURABLE RESIN COMPOSITIONS

Keiun Ko, Minoo; Naomitsu Takashina; Shigeru Shiokawa, both of Fujisawa, and Rokuro Fujita, Chigasaki, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Japan

Filed July 25, 1975, Ser. No. 598,941
Claims priority, application Japan, July 31, 1974, 49-87086
Int. Cl.[2] C08L 63/00; C08G 63/12
U.S. Cl. 260—75 UA 18 Claims

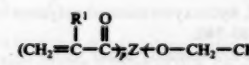
1. A liquid in air-curable resin composition comprising

A. an unsaturated oligomer having a number average molecular weight of 500 to 4000 and containing at the end of the molecule at least two member selected from the group consisting of acryloyl and methylacryloyl groups, and at least one ethylenically unsaturated double bond in the oligomer chain which oligomer is expressed by the following formula:



wherein R^1 is a hydrogen atom or a methyl group, Y represents an ethylenically unsaturated polyepoxide or polyester oligomer residue containing up to 15 acyl structural units derived from ethylenically unsaturated monomers bonded to each other through —O— or —COO—, and *m* is a number of from 2 to 10 and

B. an oligomer having a number average molecular weight of 500 to 4000 which contains at the ends of the molecule at least two member selected from a group conssiting of acryloyl and methacryloyl groups, and at least one pendant allyloxy group in the oligomer chain, said oligomer having an allyloxy group equivalent of not more than 500 and being free from an ethylenic internal double bond in the oligomer chain, said oligomer being expressed by the following formula



wherein R^1 is a hydrogen atom or a methyl group, Z represents an oligomer residue defined as Y but not containing an ethylenic internal double bond, *p* is a number of from 2 to 10, and *q* is a number of from 1 to 15,

the weight ratio of (A) to (B) being 8:2 to 2:8.

4,049,635

PRODUCTION OF TETRAMETHYLENE TEREPHTHALATE POLYMERS USING 225° TO 248° C. POLYCONDENSATION TEMPERATURE

James W. Cleary, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 19, 1976, Ser. No. 649,951
Int. Cl.[2] C08G 63/14
U.S. Cl. 260—75 R 8 Claims

1. A process for preparing a polyester comprising; transesterifying 1,4-butanediol and at least one dialkyl benzenedicarboxylate consisting of 80 to 100 mole percent of at least one dialkyl terephthalate and 0–20 mole percent of at least one ester selected from dialkyl phthalates and dialkyl isophthalates, each of said alkyls of said dialkyl benzenedicarboxylate being selected from alkyl groups having 1 to 4 carbon atoms, by contacting said 1,4-butanediol and said at least one dialkyl benzenedicarboxylate with a transesterification and polycondensation catalyst consisting essentially of a tetraalkyl titanate of the formula $Ti(OR)_4$ wherein R is an alkyl group having 1 to 6 carbon atoms, said contacting being carried out at a temperature within a range of 130° C. to 248° C. at substantially atmospheric pressure; and thereafter subjecting the resulting mixture in a melt state to a temperature within the range of 225° to 248° C. and reduced pressure for a time within the range of 2 to 8 hours to effect polycondensation, said temperature during said polycondensation at no time exceeding 248° C.

4,049,636

THERMALLY STABLE POLYURETHANE ELASTOMER USEFUL IN MOLDING FLEXIBLE AUTOMOBILE EXTERIOR BODY PARTS

Chung-Ling Mao, Sandy Hook, and Francis X. O'Shea, Naugatuck, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,212
Int. Cl.[2] C08G 18/04
U.S. Cl. 260—77.5 CR 4 Claims

1. A thermally stable polyurethane elastomer which is a reaction product of: (a) a poly(oxypropylene)poly(oxyethylene) glycol of molecular weight of from about 1500 to about 4000 and containing from 15% to 50% oxyethylene groups by weight; (b) a graft polyol of molecular weight from about 2500 to about 4500, prepared by the in situ polymerization of ethylenically unsaturated monomeric material in a glycol selected from the group consisting of (i) poly(oxypropylene) glycol, (ii) poly(oxypropylene)-poly(oxyethylene) glycol containing less than 15% by weight oxyethylene groups, and (iii) a mixture of poly(oxypropylene) glycol and poly(oxypropylene)-poly(oxyethylene) glycol containing less than 15% by weight oxyethylene groups, the amount of polymerized monomer in the graft polyol being from 5 to 50% by weight; (c) methylenebis(4-phenylisocyanate); and (d) 1,4-butanediol; the ratio of (a)/(b) being from about 90/10 to 10/90 by weight, the NCO/OH equivalents ratio being from 0.95 to 1.1, and the molar ratio of (d) to (a) plus (b) being from 6/1 to 12/1, said elastomer having a hardness of about 40 to 55 Shore D, an elongation of greter than 300%, an ultimate tensile strength of at least 3,000 psi and a Die C tear strength of at least 500 pli, said elastomer displaying improved thermal stability as evidenced by its ability to retain at least twice as much of its original tensile strength, after exposure to a temperature of 400° F. for 20 minutes, as a similar elastomer in which (a) contains 10% or less of oxyethylene groups or in which (a) is omitted.

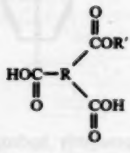
4,049,637

POLYMER PREPARED FROM HYDRAZINE AND TRICARBOXYLIC ACID DERIVATIVES AND METHOD OF PREPARATION

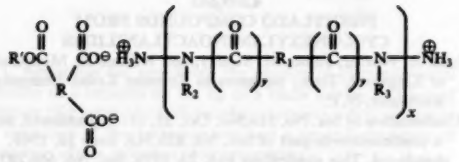
Karl F. Schimmel, Verona, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 628,611, Nov. 4, 1975, which is a division of Ser. No. 511,337, Oct. 2, 1974, Pat. No. 3,969,566, which is a division of Ser. No. 369,629, June 13, 1973, Pat. No. 3,882,086.
This application Nov. 16, 1976, Ser. No. 742,310
Int. Cl.[2] C08G 73/08, 73/10
U.S. Cl. 260—78 TF 2 Claims

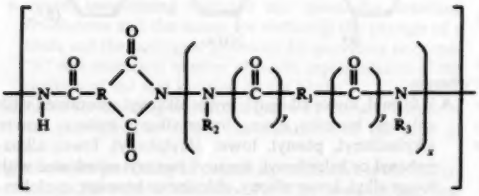
1. The method of producing a high temperature polymer comprising mixing a tricarboxylic monoanhydride with a monofunctional alcohol and heating at reflux the mixture so formed to thereby form an ester-acid having the structural formula:



mixing said ester acid with a sufficient amount of a member selected from the group consisting of a hydrazine and a hydrazide, to thereby form a polysalt having the structural formula:



and heating said polysalt at a temperature sufficient to form a high temperature resistant polymer having the structural formula:



where R is a trivalent organic radical having at least two carbon atoms; R_1 is a divalent organic radical having at least two carbon atoms; R_2 and R_3 are selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, and hydrogen radicals and x and y are either 1 or 0.

4,049,638

MANUFACTURE OF POLYLACTAMS WITH INITIAL PRESSURES ABOVE VAPOR PRESSURES OF STARTING MATERIALS

Helmut Doerfel, Heidelberg, and Claus Cordes, Weisenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Sept. 2, 1975, Ser. No. 609,693
Claims priority, application Germany, Sept. 12, 1976, 2443566
Int. Cl.[2] C08G 69/16
U.S. Cl. 260—78 L 13 Claims

1. A process for the continuous production of a solid polyamide by continuously transporting a mixture of one or more lactams and from 1 to 15% based on lactam of water through a number of successive reaction zones under polyamide-forming conditions, which comprises:

a. heating the mixture of starting materials in the first reaction zone to a temperature of from 210° to 330° C at minimum pressures of at least 20 atm. and which pressures are above the respective vapor pressures of the starting materials and prevent the formation of a vapor phase in said first reaction zone, said heating being effected for from 5 minutes to 2 hours until the polymerizable mixture has been polymerized to a conversion of at least 70%, but not to completion, said polymerizable mixture occuring in said first reaction zone under plug flow conditions, and transferring said polymerizable mixture to a next zone;

b. adiabatically reducing the pressure of the polymerizable mixture in the second zone to pressures of from 1 to 11 atm and then transferring to and immediately heating in a third reaction zone, with the application of heat and evaporation of the major portion of the water at the said pressure obtained by pressure reduction or at a pressure which is lower than said pressure, said heating being carried out for less than 10 minutes but long enough to ensure evaporation of the major portion of the water at temperatures of from 250° to 350° C, and transferring the polymerizable mixture to a next zone;

c. separating the polymerization mixture from the steam in a fourth reaction zone and polymerizing to completion in a further reaction stage to increase the molecular weight of the solid polyamide.

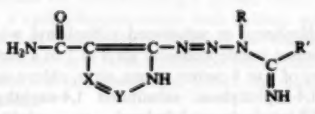
4,049,639

5-AMIDO IMIDO TRIAZENE TRIAZOLES AND PYRAZOLES WITH PHOTOGRAPHIC AND ANTIMYCOTIC UTILITY

József Schawartz; Maria Hornyák; Éva Majorszki; Erzsebet Kovacsovics; Ágoston Dávid, and Gábor Horváth, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszetl Termekek Gyara Rt, Budapest, Hungary

Continuation-in-part of Ser. No. 302,724, Nov. 1, 1972, abandoned. This application Feb. 13, 1975, Ser. No. 549,761
Claims priority, application Hungary, Nov. 19, 1971, CI 1190
Int. Cl.[2] C07C 107/00, 107/04; G03C 5/30
U.S. Cl. 260—140 19 Claims

1. A compound of the formula:



wherein:

X is —CH= or nitrogen;

Y is =CH— or nitrogen;

R is C_1 to C_6 alkyl, C_3 to C_6 cycloalkyl, phenyl or halophenyl; and

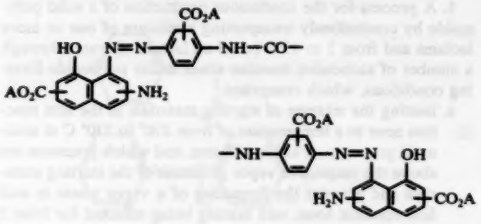
R′ is phenyl or phenyl substituted by C_1 to C_6 alkoxy or C_1 to C_6 alkyl, or is C_1 to C_6 alkyl.

4,049,640
SUBSTITUTED BISNAPHTHYLAZO DIPHENYL UREIDO COMPLEMENT INHIBITORS

Ransom Brown Conrow, Pearl River; Seymour Bernstein, New City, and Norman Bauman, Nanuet, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 12, 1975, Ser. No. 640,100
Int. Cl.[2] C07C *107/08;* C09B *43/14;* A61K *31/655*
U.S. Cl. 260—175 3 Claims

1. A compound selected from those of the formula:



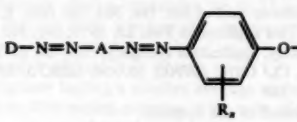
wherein A is H, Na or K, with the proviso that A is identical in the same compound.

4,049,641
OPTIONALLY SUBSTITUTED SULFOPHENYL-AZO-NAPHTHYLENE-AZO-PARA-ALKOXYPHENYL DYES

Martin Studer, Bettingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 344,935, March 26, 1973, Pat. No. 3,951,590, which is a continuation of Ser. No. 45,546, June 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 743,054, July 8, 1968, abandoned. This application Dec. 18, 1975, Ser. No. 642,192
Claims priority, application Switzerland, July 27, 1967, 10645/67
Int. Cl.[2] C09B *43/00*
U.S. Cl. 260—191 10 Claims

1. A compound of the formula



wherein

D is sulfophenyl or substituted sulfophenyl wherein each substituent is independently alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, nitro, chloro or bromo,

A is 1,4-naphthylene, substituted 1,4-naphthylene, 1,4-(5,6,7,8-tetrahydronaphthylene) or substituted 1,4-(5,6,7,8-tetrahydronaphthylene), wherein each substituent of substituted 1,4-naphthylene and substituted 1,4-(5,6,7,8-tetrahydronaphthylene) is independently lower alkyl, lower alkoxy, chloro or bromo,

each

R is independently alkyl of 1 to 4 carbon atoms, and

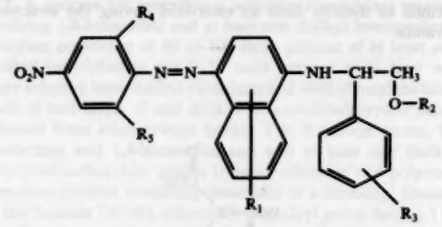
n is 0, 1 or 2.

4,049,642
PHENYL-AZO-NAPHTHYL DYES HAVING A 2-ACYLOXY, ALKOXY OR HYDROXY-1-ARYLETHYLAMINO GROUP IN THE 4-POSITION OF THE NAPHTHALENE RING

Wolfgang Groebke, Oberwil, and Klaus Körte, Therwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 538,376, Jan. 3, 1975, abandoned. This application July 12, 1976, Ser. No. 704,718
Claims priority, application Switzerland, Jan. 11, 1974, 352/74
Int. Cl.[2] C09B *29/06, 29/28;* D06P *3/24, 3/52*
U.S. Cl. 260—196 28 Claims

1. A compound of the formula



wherein each of

R_1 and R_3 is independently hydrogen, hydroxy, chloro, bromo, C_{1-4}alkyl, C_{1-4}alkoxy, (C_{1-4}alkyl)- carbonyl, (C_{1-4}alkoxy)carbonyl, (C_{1-4}alkyl)- carbonylamino or (C_{1-4}alkoxy)carbonylamino,

R_2 is hydrogen, (C_{1-4}alkyl)carbonyl, (C_{1-4}alkoxy)- carbonyl, benzoyl, C_{1-4}alkyl or C_{1-4}alkyl monosubstituted by C_{1-4}alkoxy, phenoxy, benzyloxy, halo or hydroxy,

R_4 is nitro or cyano, and

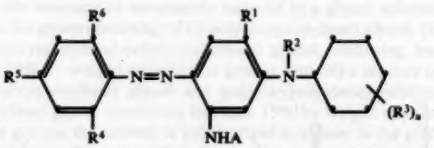
R_5 is chloro or bromo.

4,049,643
PHENYLAZO COMPOUNDS FROM CYCLOHEXYLAMINOACYLANILIDES

Max A. Weaver; James M. Straley, and William H. Moore, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 514,964, Oct. 15, 1974, abandoned, and a continuation-in-part of Ser. No. 833,743, June 16, 1969, abandoned. This application Feb. 23, 1976, Ser. No. 660,287
Int. Cl.[2] C09B *29/08, 29/26;* D06P *1/04, 3/52*
U.S. Cl. 260—207.1 8 Claims

1. A water-insoluble azo compound having the formula



wherein

A is formyl; lower alkanoyl; lower alkanoyl substituted with chlorine, bromine, cyano, lower alkoxy, hydroxy, lower alkylsulfonyl, phenyl, lower alkylphenyl, lower alkoxyphenyl or halophenyl; benzoyl; benzoyl substituted with lower alkyl, lower alkoxy, chlorine or bromine; cyclohexylcarbonyl; lower alkoxycarbonyl; lower alkoxycarbonyl substituted with hydroxy or cyano;

R^1 is hydrogen, lower alkyl, or lower alkoxy;

R^2 is hydrogen, lower alkyl; or lower alkyl substituted with cyano, lower alkanoyloxy, or cyclohexyl;

R^3 is lower alkyl and

n is 0, 1, 2 or 3;

R^4 is hydrogen, chlorine, bromine, cyano, lower alkanoyl, lower alkoxycarbonyl, lower alkylsulfonyl or trifluoromethyl;

R^3 is nitro, lower alkylsulfonyl, thiocyanato, or sulfamoyl; and

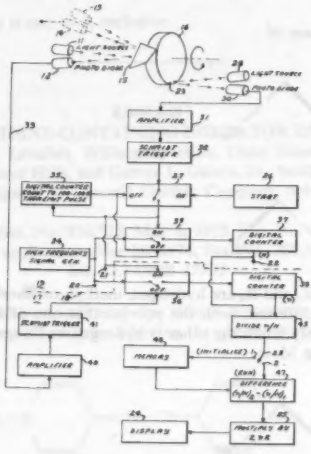
R^6 is hydrogen, chlorine, bromine, formyl, lower alkanoyl, lower alkoxycarbonyl, trifluoromethyl, lower alkylsulfonyl, sulfamoyl, carbamoyl, cyano, or nitro.

4,049,644

DEVICE FOR MEASURING TIP DEFLECTION OF ROTATING BLADES

Arthur J. Wennerstrom, 215 Mar-Ken Drive, Dayton, Ohio 45405

Filed June 23, 1976, Ser. No. 699,902
Int. Cl.² G01D *5/36;* H01J *39/12*
U.S. Cl. 250—233 **4 Claims**



1. Apparatus for measuring the change of circumferential position of a location on the tip of a blade having a radius of rotation of a rotor of a turbomachine between a first condition of operation of the turbomachine and a second condition of operation of the turbomachine comprising:

a. means for detecting revolutions of the said rotor;

b. means for detecting the passage of a blade past a given location;

c. a high frequency signal generator generating a signal of a uniform train of pulses;

d. means cooperating with the said means for detecting revolutions and the said signal generator for providing an output "N" representative of the numerical number of pulses per revolution;

e. means cooperating with the said means for detecting revolutions and the means for detecting the passage of a blade and the said signal generator for providing an output "*n*" of a numerical number of pulses representative of the position of the said location on the blade;

f. means for dividing the said output *n* by the said output N and providing an output representative of the ratio of *n*/N;

g. means for providing an output representative of the difference in the value of the ratio of *n*/N between the said first condition of operation and the said second condition of operation of the turbomachine;

h. means for providing a product output of the multiplication of the said difference output and 2π times the numerical value of the said radius of the said blade tip; and

i. means for digitally displaying the said product output.

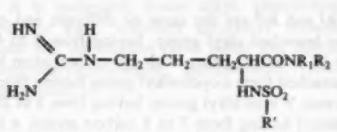
4,049,645

N²-NAPHTHALENESULFONYL-L-ARGININE DERIVATIVES, AND THE PHARMACEUTICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF

Shosuke Okamoto, Kobe; Ryoji Kikumoto; Kazuo Ohkubo; Shinji Tonomura, all of Tokyo; Yoshikuni Tamao; Tohru Tezuka, both of Yokohama, and Akiko Hijikata, Kobe, all of Japan, assignors to Mitsubishi Chemical Industries Limited and Shosuke Okamoto, both of Tokyo, Japan

Continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Mar. 29, 1976, Ser. No. 671,568
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-23268; Feb. 26, 1975, 50-23635; Mar. 5, 1975, 50-26768; Mar. 11, 1975, 50-29357; Mar. 11, 1975, 50-29358
Int. Cl.² C07D *223/04, 225/02;* A61K *31/395, 31/445;* C07D *295/10, 211/08;* A61K *31/18, 31/04*
U.S. Cl. 260—239 B **10 Claims**

1. N^2-naphthalenesulfonyl-L-arginine amides having the formula



I

or the acid addition salts thereof with a pharmaceutically acceptable acid, wherein R_1 and R_2 are members selected from the group consisting of hydrogen and a hydrocarbon selected from the group consisting of alkyl, aryl, cycloalkyl, respectively containing not more than 10 carbon atoms, and aralkyl and cycloalkylalkyl, respectively containing not more than 15 carbon atoms, or R_1 and R_2 together are polymethyleneiminyl of 3-10 carbon atoms, optionally substituted by 1 or 2 alkyl groups containing not more than 10 carbon atoms; and R′ is a member selected from the class consisting of 5, 6, 7, 8-tetrahydro-1-naphthyl, 5,6,7,8-tetrahydro-2-naphthyl, 1-naphthyl, 2-naphthyl, 1-naphthyl substituted with one member selected from the class consisting of halogen, nitro, cyano, hydroxy, alkyl containing not more than 10 carbon atoms, 2-naphthyl substituted with one member selected from the class consisting of halogen, nitro, cyano, hydroxy and alkyl containing not more than 10 carbon atoms.

4,049,646

PROCESS FOR THE MANUFACTURE OF LACTAMS

Herbert Furkert, Grosskonigsdorf, Germany, assignor to Davy Powergas GmbH, Cologne, Germany

Filed June 9, 1972, Ser. No. 261,220
Claims priority, application Germany, June 18, 1971, 2130037
The portion of the term of this patent subsequent to Sept. 25, 1990, has been disclaimed.
Int. Cl.² C07D *201/04*
U.S. Cl. 260—239.3 A **17 Claims**

1. In a process for manufacturing a lactam which includes rearranging a cycloalkanone-oxime with sulfuric acid or to form said lactam, completely neutralizing the rearrangement mixture with ammonia to form ammonium sulfate, and separating said lactam and said ammonium sulfate, the improvement which comprises:

a. forming said ammonium sulfate into finely divided particles;

b. burning said particles at a temperature of 850° – 1250° C. to form an SO_2-containing gas;

c. oxidizing said SO_2-containing gas to form sulfuric acid; and

d. recycling at least a portion of said sulfuric acid to the cycloalkanone-oxime rearrangement step.

4,049,647

BIS PIPERIDYL CARBOXYLATES

Brian Holt, Royton, and Donald Richard Randell, Stockport, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

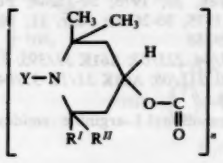
Division of Ser. No. 310,031, Nov. 28, 1972, abandoned. This application May 14, 1975, Ser. No. 577,534

Claims priority, application United Kingdom, Nov. 30, 1971, 55487/71; June 17, 1972, 28458/72; July 28, 1972, 35473/72

Int. Cl.[2] C07D *401/12*

U.S. Cl. 542—426 3 Claims

1. A compound having the formula:



wherein R^I and R^{II} are the same or different and each is a straight or branched alkyl group, having from 1 to 4 carbon atoms, or R^I or R^{II}, together with the carbon atom to which they are attached form a cycloalkyl group having from 5 to 12 carbon atoms; Y is an alkyl group, having from 5 to 20 carbon atoms, alkenyl having from 7 to 9 carbon atoms, *n* is 2, R is alkylene having from 1 to 20 carbon atoms, cycloalkylene having from 5 to 12 carbon atoms, arylene, vinylene, propenylene, p-xylylene, the group $—CH_2CH_2SCH_2CH_2—$ or R is absent; and a salt thereof selected from phosphate, carbonate, sulfate, chloride, acetate, stearate, maleate, citrate, tertrate, oxalate, benzoate and substituted carbamate.

4,049,648

PG-TYPE, 1,9-LACTONES

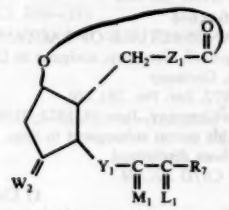
Gordon L. Bundy, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 589,724, June 23, 1975, abandoned. This application Mar. 29, 1976, Ser. No. 670,522

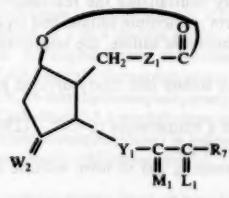
Int. Cl.[2] C07D *313/00*

U.S. Cl. 542—426 90 Claims

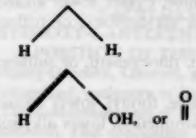
1. A prostaglandin-type, 1,9-lactone of the formula



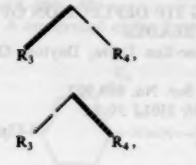
or



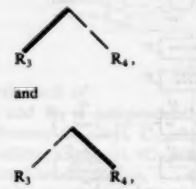
wherein W_2 is



wherein L_1 is

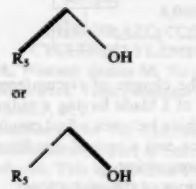


or a mixture of



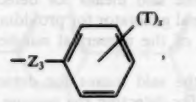
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro, only when the other is hydrogen or fluoro;

wherein M_1 is



wherein R_5 is hydrogen or methyl;

wherein R_7 is $—(CH_2)_m—CH_3$, wherein m is one to 5, inclusive, cis—CH=CH—CH_2—CH_3, or



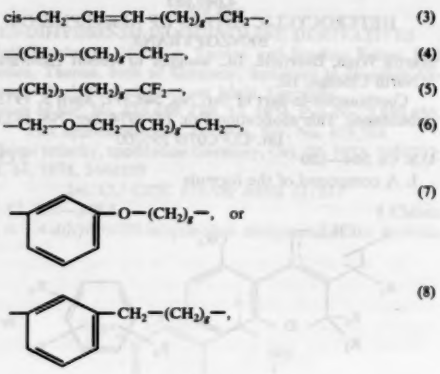
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, *s* is zero, one, 2, or 3, and Z_3 is oxa or methylene, with the provisio that not more than two T's are other than alkyl, and the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different;

wherein Y_1 is trans—CH=CH—, $—CH_2CH_2—$, cis—CH=CH—, or —C≡C—; and

wherein Z_1 is

cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—, (1)

cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—, (2)



wherein *g* is one to 3, inclusive.

4,049,649

PYRIDINE-CONTAINING INDICATOR DYE

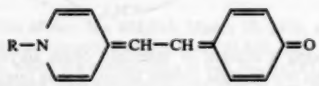
Francois A. Lavallee, Willoughby Hills, Ohio; Donald G. Le Grand, Burnt Hills, and George L. Gaines, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 574,725, May 5, 1975, Pat. No. 4,013,414. This application June 28, 1976, Ser. No. 700,256

Int. Cl.[2] C09B *17/02*

U.S. Cl. 542—400 **2 Claims**

1. An acid-base indicator dye which comprises a soluble organic nitrogen compound having the general formula



wherein R is an aliphatic hydrocarbon radical having 12 to 20 carbon atoms, said acid-base indicator dye producing a color change when dissolved in an organic solvent so that the color change shifts to longer wavelengths with increasing polarity of the solvent.

4,049,650

1-[[[5-(SUBSTITUTED PHENYL)-2-OXAZOLYL]METHYLENE]AMINO]-2,4-IMIDAZOLIDINEDIONES

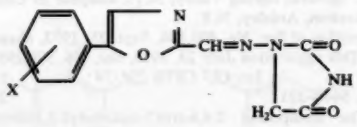
Ralph L. White, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,296

Int. Cl.[2] C07D *405/06*

U.S. Cl. 542—400 **11 Claims**

1. A compound of the formula:



wherein X represents hydrogen, 4-halo, 3,4-dichloro, 4-nitro, 4-methoxy, 4-methyl or 3-trifluoromethyl.

4,049,651

ALKOXY AND ALKYLTHIOALKYLUREIDO CEPHALOSPORINS

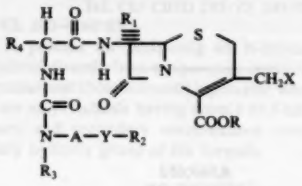
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 19, 1976, Ser. No. 678,001

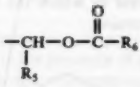
Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—21 **18 Claims**

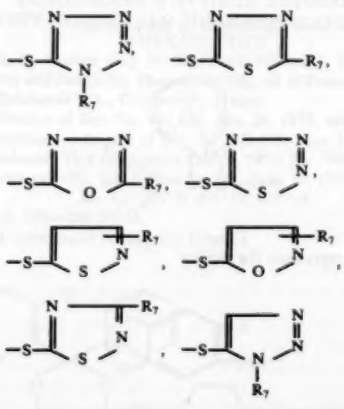
1. A compound of the formula



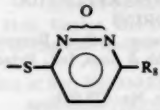
wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl)silyl, trihaloethyl, an alkali metal ion, an alkaline earth metal ion, dibenzylamine, N,N-dibenzylethylenediamine, methylamine, triethylamine, N-ethylpiperidine, or



R_1 is in the α-configuration and is hydrogen or methoxy; R_2 is lower alkyl; Y is O or S; R_3 is hydrogen or lower alkyl; A is straight or branched chain alkylene of 1 to 6 carbons; R_4 is phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, and hydroxy, or a substituted or unsubstituted heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl, and 3-furyl wherein said heterocyclic substituent is attached at an available carbon atom and is halogen or lower alkyl of 1 to 4 carbons; R_5 is hydrogen or lower alkyl; R_6 is lower alkyl; and X is a heterothio selected from the group consisting of



and



wherein R_7 is hydrogen or lower alkyl of 1 to 4 carbons and R_8 is hydrogen, lower alkyl of 1 to 4 carbons, methoxy, hydroxy, or halogen.

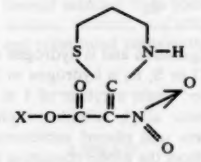
4,049,652

ESTERS OF NITRO(TETRAHYDRO-2H-1,3-THIAZIN-2-YLIDENE)ACETIC ACID

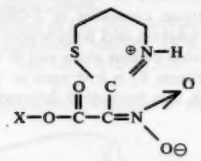
Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed July 19, 1976, Ser. No. 706,311
Int. Cl.² C07D *279/06*
U.S. Cl. 544—54 **2 Claims**

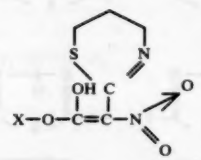
1. A resonance hybrid in which the significant forms are represented by the formulae



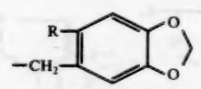
and



and the enol form represented by the formula



wherein X represents the moiety



wherein R represents hydrogen, middle halogen, cyano, nitro or alkyl of from one to three carbon atoms.

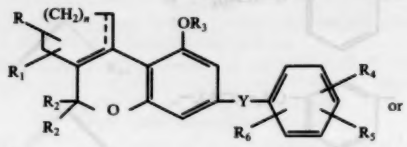
4,049,653

HETEROCYCLIC ESTERS OF ALKYLPHENYL BENZOPYRANS

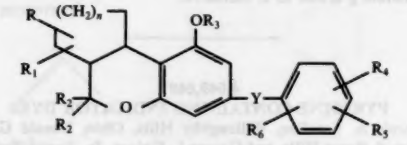
Martin Winn, Deerfield, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 348,371, April 5, 1973, abandoned. This application Feb. 13, 1974, Ser. No. 442,033
Int. Cl.² C07D *295/00*
U.S. Cl. 544—150 **5 Claims**

1. A compound of the formula

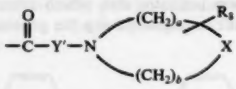


I



II

wherein n is 1 or 2; each R and R_1 are the same or different members of the group consisting of hydrogen or loweralkyl; R_2 is loweralkyl; R_3 is



with Y' being a straight or branched chain alkylene group having from one to eight carbon atoms, a is an integer from 1 to 4, b is an integer fro 1 to 4, X is O; R_8 is hydrogen or loweralkyl; Y is a straight or branched chain alkylene group having from one to ten carbon atoms; and each R_4 and R_5 and R_6 are the same or different members of the group consisting of hydrogen, halo, trifluoromethyl or loweralkyl; and the pharmaceutically acceptable salts thereof.

4,049,654

2,3,5-TRIALKYLSUBSTITUTED HYDROXYBENZYL ISOCYANURATES

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 400,604, Sept. 25, 1973, abandoned. This application July 23, 1975, Ser. No. 598,295
Int. Cl.² C07D *251/34*
U.S. Cl. 544—221 **2 Claims**

1. The compound 2,4,6-tris(5-tert.-butyl-2,3-dimethyl-4-hydroxybenzyl) isocyanurate.

2. The compound 2,4,6-tris{(5-(1,1,3,3-tetramethylbutyl)-2,3-dimethyl-4-hydroxybenzyl) isocyanurate.}.

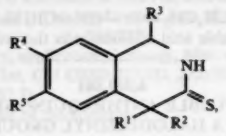
4,049,655

1,4-DIHYDRO-2H-ISOQUINOLINE DERIVATIVES

Rudolf Kunstmann, Hofheim, Taunus, and Joachim Kaiser, Bad Soden, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 515,659, Oct. 17, 1974, Pat. No. 3,980,655. This application Apr. 23, 1976, Ser. No. 679,784
Claims priority, application Germany, Oct. 20, 1973, 2352702; Sept. 14, 1974, 2444109
Int. Cl.[2] C07C *413/06*; A61K *31/535*
U.S. Cl. 424—248.5 4 Claims

1. A 1,4-dihydro-2H-isoquinoline compound of the formula



and physiologically tolerated salts thereof, wherein R^1 is hydrogen or straight-chain or branched alkyl of 1–6 carbon atoms; R^2 is morpholine-loweralkyl; R^3 is pyridyl, phenyl, or phenyl mono- or di-substituted by halo, nitro, amino, alkanoylamino having 1 to 4 carbon atoms or alkyl having 1 to 4 carbon atoms; and R^4 and R^5, which may be the same or different, are hydrogen or alkoxy having 1 to 4 carbon atoms.

4. A method for treating arrhythmia in a patient suffering therefrom which comprises administering an anti-arrhythmically effective amount of a compound as in claim 1.

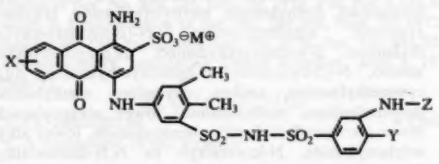
4,049,656

FIBRE-REACTIVE ANTHRAQUINONE DYESTUFFS

Peter Hindermann, Bottmingen, and Hubert Meindl, Riehen, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 452,515, March 19, 1974, abandoned, which is a continuation of Ser. No. 269,889, July 7, 1972, abandoned, which is a continuation of Ser. No. 862,013, Sept. 29, 1969, abandoned. This application July 7, 1975, Ser. No. 593,534
Claims priority, application Switzerland, Oct. 3, 1968, 14805/68
Int. Cl.[2] C07D *239/24*
U.S. Cl. 260—256.5 R 5 Claims

1. A dyestuff of the formula

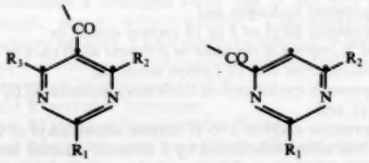


wherein

X and Y represent independently of each other hydrogen or $SO_3^-M^+$,

M^+ represents hydrogen, alkali metal or ammonium, and

Z represents a radical of one of the formulas:



wherein

R_1 represents halogen or lower alkylsulfonyl;

R_2 represents halogen;

R_3 represents hydrogen or halogeno-loweralkyl.

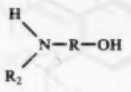
4,049,657

PREPARATION OF N-(AMINOALKYL)PIPERAZINE

Michael E. Brennan; Philip H. Moss, and Ernest L. Yeakey, all of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed June 2, 1975, Ser. No. 583,019
Int. Cl.[2] C07D *295/12*, *241/00*
U.S. Cl. 260—268 SY 8 Claims

1. A process for producing an N-(aminoalkyl)piperazine compound directly from a piperazine compound selected from piperazine and C-(substituted) piperazine wherein the substituents are alkyl radicals having from 1 to 5 carbon atoms and a primary and secondary aminoalkanol compound having a primary hydroxy group of the formula:



wherein R is a branched or straight chain alkyl radical having from 2 to 10 carbon atoms and R_2 is hydrogen or an alkyl radical having from 1 to about 4 carbon atoms, comprising the steps of:

contacting said piperazine compound with said alkanolamine compound in the presence of a catalytically effective amount of a phosphorus-containing substance selected from the group consisting of acidic metal phosphates, phosphoric acids and their anhydrides, or phosphorous acids and their anhydrides, alkyl or aryl phosphate esters, alkyl or aryl phosphite esters, alkyl or aryl substituted phosphorous acids and phosphoric acids, alkali metal monosalts of phosphoric acid, the thioanalogs of the foregoing, and mixtures thereof at temperatures of from about 250° to about 350° C under a pressure sufficient to maintain the mixture essentially in liquid phase; and,

recovering the N-(aminoalkyl)piperazine thus produced from the resultant reaction mixture.

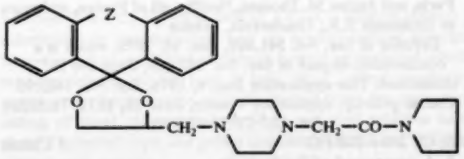
4,049,658

N'-SUBSTITUTED DERIVATIVES OF 4'-(N-PIPERAZINYLMETHYL) SPIRO DIBENZOCYCLOHEPTADI- (OR TRI-) ENE-5, 2'-DIOXOLANE (1',3') THEIR METHOD OF PREPARATION AND THEIR APPLICATION IN THERAPEUTICS

Claude P. Fauran; Guy M. Raynaud; Michel J. Turin, all of Paris, and Janine M. Thomas, Neuilly, all of France, assignors to Delalande S.A., Courbevoie, France

Division of Ser. No. 541,609, Jan. 16, 1975, which is a continuation-in-part of Ser. No. 263,409, June 16, 1972, abandoned. This application Dec. 6, 1976, Ser. No. 748,094
Claims priority, application France, June 18, 1971, 71.22226
Int. Cl.[2] C07D *405/14*, *407/14*
U.S. Cl. 260—268 PC 1 Claim

1. A compound having the formula



wherein Z is —CH_2CH_2—, and the pharmacologically acceptable acid addition salts thereof.

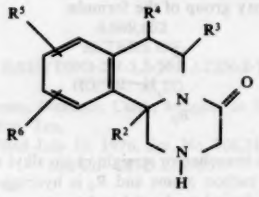
4,049,659

PROCESS FOR THE PREPARATION OF 4-OXO-HEXAHYDRO-PYRAZINOISOQUINOLINE DERIVATIVES

Rolf Pohlke, Darmstadt, Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

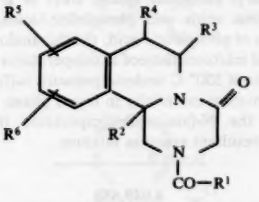
Filed Feb. 27, 1976, Ser. No. 662,009
Claims priority, application Germany, Mar. 1, 1975, 2508947
Int. Cl.² C07D *471/04*
U.S. Cl. 260—268 TR **10 Claims**

1. In a process for preparing a 4-oxo-hexahydro-4H-pyrazino-isoquinoline compound of the formula



wherein R^2, R^3 and R^4 are each H or methyl and R^5 and R^6 are each H, methyl or methoxy, as well as the physiologically compatible acid addition salts thereof, the improvement which comprises:

hydrolyzing a 2-acyl-4-oxo-1,2,3,6,7,11b-hexahydro-4H-pyrazino[2,1-]isoquinoline of the formula



wherein R^1 is H, alkyl of 1–5 carbon atoms, phenyl or phenyl substituted by one or more alkyl or alkoxy of up to 4 carbon atoms or by halogen, with an oxygen-containing inorganic acid of pentavalent phosphorus or of hexavalent sulfur or with an acid salt thereof to form said 4H-pyrazino-isoquinoline derivative.

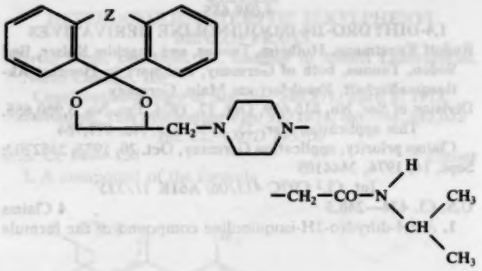
4,049,660

N-SUBSTITUTED DERIVATIVES OF 4 (N-PIPERAZINYLMETHYL) SPIRO DIBENZOCYCLOHEPTADI- (OR TRI-) ENE-5, 2-DIOXOLANE (1,3) THEIR METHOD OF PREPARATION AND THEIR APPLICATION IN THERAPEUTICS

Claude P. Fauran; Guy M. Raynaud; Michel J. Turin, all of Paris, and Janine M. Thomas, Neuilly, all of France, assignors to Delalande S.A., Courbevoie, France

Division of Ser. No. 541,609, Jan. 16, 1975, which is a continuation-in-part of Ser. No. 263,409, June 16, 1972, abandoned. This application Dec. 6, 1976, Ser. No. 748,095
Claims priority, application France, June 18, 1971, 71.22226
Int. Cl.² C07D *405/06*
U.S. Cl. 260—268 PC **7 Claims**

1. A compound of the formula



wherein Z is —CH_2CH_2— or —CH=CH, and the pharmacologically acceptable acid addition salts thereof.

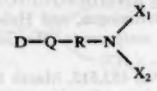
4,049,661

WATER-INSOLUBLE ANTHRAQUINONE DYESTUFFS CONTAINING A HALODIAZINYL GROUP WHICH ARE SOLUBLE IN APROTIC SOLVENTS

Herbert Seiler, Riehen, near Basel, and Paul Dussy, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 412,242, Nov. 2, 1973, Pat. No. 3,974,160, which is a division of Ser. No. 8,422, Feb. 3, 1970, Pat. No. 3,843,624. This application Feb. 23, 1976, Ser. No. 660,403
Claims priority, application Switzerland, Feb. 26, 1969, 2862, July 7, 1969, 10311
Int. Cl.² C07D *239/00*; C09B *5/16, 5/44*; D06P *3/10*
U.S. Cl. 260—256.4 N **4 Claims**

1. A reactive dyestuff, containing no acid, salt-forming, water-solubilizing groups, of the formula



wherein

D represents the radial of an anthraquinone dyestuff which is unsubstituted or substituted only by halogen, cyano, nitro, lower alkyl, lower alkenyl, perfluoro(lower)alkyl, hydroxy(lower)alkyl, cyanoethyl, β,β-dicyanovinyl, lower alkoxy, phenoxy, methylphenoxy, lower alkylthio, phenylthio, lower alkanoyl, lower alkylsulphonyl, phenylsulfonyloxy, dimethylamino, amino, N-(β-cyanoethyl)-ethylamino, diethylamino, methylethylamino, ethylbenzylamino, ethylbutylamino, N-(β-hydroxyethyl)-ethylamino, β-hydroxyethylamino, di(β-hydroxyethyl-)amino, N-(β-cyanoethyl)-β-hydroxyethylamino, di(β-cyanoethyl)amino, anilino, oxyanilino, methylamino, dimethylanilino, methylanilino, lower alkanoylamide, lower alkoxycarbonylamide, benzoylamide, lower alkylsulphonylamide, N-loweralkyl- or N,N-diloweralkyl-lower alkylsulphonylamide, or hydroxy,

Q represents a bridging member —NX_3, —O—, —S—or —NX_3CO—, wherein X_3 represents hyrogen or lower alkyl,

R represents diazinyl containing only chlorine, bromine or fluorine substituents, each of which can be split off as anion and which is bound to a ring carbon atom adjacent to a tertiary nitrogen atom,

X_1 represents hydrogen and

X_2 represents alkyl of 8 to 18 carbon atoms, or

X_1 and X_2 represent the same or different alkyl each of which contains from 8 to 18 carbon atoms; or

X_1 represents cyclohexyl or cyclohexyl substituted by lower alkyl, and

X_2 represents alkyl of 1 to 18 carbon atoms, alkyl of 1 to 18 carbon atoms substituted by a member selected from the group consisting of hydroxyl, lower alkoxy, lower al-

kenyloxy and cyano, lower alkenyl, cyclohexyl or cyclohexyl substituted by lower alkyl.

4,049,662

4-QUINOLINE AND ISOQUINOLINE SUBSTITUTED 2,6-DIAMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

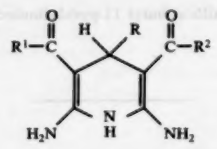
Division of Ser. No. 454,996, March 27, 1974, Pat. No. 3,950,336, which is a division of Ser. No. 336,483, Feb. 28, 1973, Pat. No. 3,855,231. This application Jan. 28, 1975, Ser. No. 544,837

Claims priority, application Germany, Mar. 6, 1972, 2210687

Int. Cl.[2] C07D *217/00, 215/50*

U.S. Cl. 260—287 D 5 Claims

1. A compound of the formula:



wherein

R is quinolyl or isoquinolyl unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno; and

each of R^1 and R^2, taken independently of the other, is lower alkyl, lower alkoxy, lower alkoxy(lower alkoxy), alkenyloxy of 2 to 4 carbon atoms, alkynyloxy of 2 to 4 carbon atoms, amino, lower alkylamino or di(lower alkyl-)amino.

4,049,663

ETHYLENE DIAMINE DERIVATIVES

Norman James Harper, Newcastle-upon-Tyne, and George Bryan Austin Veitch, Wythall, both of England, assignors to Allen & Hanburys Limited, London, England

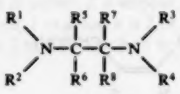
Division of Ser. No. 518,720, Oct. 29, 1974, Pat. No. 3,975,443, which is a continuation of Ser. No. 289,366, Sept. 15, 1972, abandoned. This application Apr. 30, 1976, Ser. No. 681,853

Claims priority, application United Kingdom, June 6, 1972, 26248/72

Int. Cl.[2] C07D *211/06*

U.S. Cl. 260—293.86 4 Claims

1. A compound of the formula:



(I)

wherein

R^1 represents a hydrogen atom; one of the acyl groups, formyl, acetyl, 4-fluorobenzoyl, 2-chloroenzoyl, 3,4-dichloro benzoyl, 2,3,4-trimethoxy benzoyl, 4-nitro-benzoyl, 4-aminobenzoyl; ethoxycarbonyl, methyl or ethyl;

R^2 represents hydrogen or methyl;

R^5 and R^6 represent hydrogen;

R^7 and R^8 together form cyclohexyl; and

R^3 and R^4 together with the adjacent nitrogen atom form a piperidyl group.

4,049,664

CHROMONE COMPOUNDS

Suminori Umio, Kawanish; Shizuo Maeno, Osaka; Ikuo Ueda, Yao; Yoshinari Sato, Takaishi, and Masaaki Matsuo, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

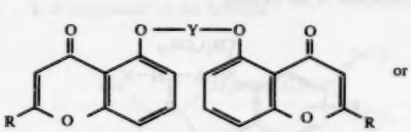
Division of Ser. No. 213,180, Dec. 28, 1971, Pat. No. 3,965,122. This application Apr. 22, 1976, Ser. No. 679,140

Claims priority, application Japan, Dec. 30, 1970, 45-129469; Dec. 30, 1970, 45-129470

Int. Cl.[2] C07D *311/22*

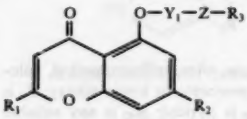
U.S. Cl. 260—294.8 C 13 Claims

1. A chromone compound selected from the group consisting of



(I)

or



(I')

wherein

R is pyridyl or thienyl,

Y is hydroxy (lower) alkylene,

R_1 is pyridyl or thienyl,

R_2 is hydrogen or lower alkoxy,

Y_1 is lower alkylene or hydroxy (lower) alkylene,

R_3 is hydrogen, lower alkyl, phenyl, carboxyphenyl, methoxycarbonyl-phenyl or benzyl, and

Z is oxygen or sulfur.

4,049,665

UNSYMMETRICAL DISULFIDES AS ANTIMICROBIAL AGENTS

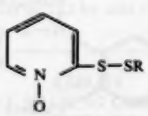
Miriam Lois Douglass, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 24, 1975, Ser. No. 644,261

Int. Cl.[2] C07D *213/04*

U.S. Cl. 260—294.8 J 6 Claims

1. An unsymmetrical disulfide compound having the structural formula:



wherein R is a C_1-C_{12} alkyl radical, a C_3-C_{12} alkenyl radical, a substituted or unsubstituted aryl or aralkyl radical selected from the group consisting of phenyl, benzyl or naphthyl which may be substituted by 1 or 2 halo, C_1-C_6 alkyl or alkoxy groups, or a heterocyclic radical selected from the class consisting of furyl, thienyl and pyridyl; and acid addition salts thereof selected from the group consisting of halides, sulfates, nitrates and acetates.

4,049,666
TRICYCLIC BENZODIAZEPINES

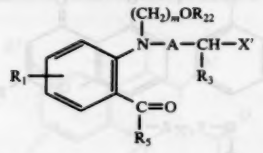
Michael Edward Derieg, Caldwell; James Valentine Earley, Cedar Grove; Rodney Ian Fryer, North Caldwell, and Leo Henryk Sternbach, Upper Montclair, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 557,438, March 11, 1975, Pat. No. 3,965,151, which is a division of Ser. No. 45,928, June 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 26,068, April 6, 1970, Pat. No. 3,905,965, which is a continuation-in-part of Ser. No. 863,377, Oct. 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 768,909, Oct. 18, 1968, abandoned. This application Apr. 12, 1976, Ser. No. 676,020

Int. Cl.[2] C07D *213/24*

U.S. Cl. 260—294.8 R **1 Claim**

1. A compound of the formula



wherein wherein R_1 is hydrogen, nitro, trifluoromethyl, halogen, lower alkyl, lower alkyl mercapto or lower alkoxy; R_3 is hydrogen, or lower alkyl; R_5 is pyridyl; R_{22} is any suitable protecting group selected from the group consisting of the acyl moiety of a lower alkanoic acid and carbobenzoxy; *m* is an integer from 1–7; A is selected from the group consisting of $—CH_2—$ and

and X' is chlorine, bromine or iodine.

4,049,667
TRICYCLIC BENZODIAZEPINES

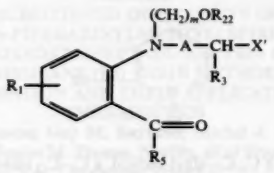
Michael Edward Derieg, Caldwell; James Valentine Earley, Cedar Grove; Rodney Ian Fryer, North Caldwell, and Leo Henryk Sternbach, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 557,438, March 11, 1975, Pat. No. 3,965,151, which is a division of Ser. No. 45,928, June 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 26,068, April 6, 1970, Pat. No. 3,905,965, which is a continuation-in-part of Ser. No. 863,377, Oct. 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 768,909, Oct. 18, 1968, abandoned. This application Apr. 12, 1976, Ser. No. 675,842

Int. Cl.[2] C07D *213/24*

U.S. Cl. 260—294.8 R **1 Claim**

1. A compound of the formula



wherein R_1 is hydrogen, nitro, trifluoromethyl, halogen, lower alkyl, lower alkyl mercapto or lower alkoxy; R_3 is the group -COO-lower alkyl; R_5 is pyridyl; R_{22} is any suitable protecting group selected from the group consisting of the acyl moiety of a lower alkanoic acid and carbobenzoxy; *m* is an integer from 1–7; A is selected from the group consisting of $—CH_2—$ and

and X' is chlorine, bromine or iodine.

4,049,668
CATIONIC FLUOROCHEMICAL SURFACTANTS

Alex J. Szur, North Plainfield, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Mar. 21, 1975, Ser. No. 560,697

Int. Cl.[2] C07D *213/20*

U.S. Cl. 260—295 R **3 Claims**

1. The cationic fluorochemical surfactant having the formula

2,2,3,4,4,4-hexafluorobutyl 11-pyridylundecylate bromide.

4,049,669
PROCESS FOR PREPARING 5-(ALKOXY- AND AMINOETHYL THIO)METHYLTHIAZOLE COMPOUNDS

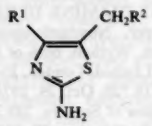
Bing Lun Lam, Haverford; Joseph James Lewis; Robert Lee Webb, both of West Chester, and George Robert Wellman, Warminster, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Oct. 29, 1975, Ser. No. 626,812

Int. Cl.[2] C07D *277/40*

U.S. Cl. 260—306.8 R **10 Claims**

1. A process for preparing a compound of the formula:

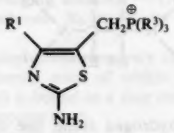


in which:

R^1 is hydrogen or lower alkyl; and

R^2 is methoxy, ethoxy, n-propoxy, n-butoxy, i-butoxy, t-butoxy or $—SCH_2CH_2NH_2$;

comprising reacting a compound of the formula:



in which:

R^1 is defined as above;

R^3 is lower alkyl or phenyl; and

X is halo,

with a compound of the formula $R^2—H$ where R^2 is defined as above in an polar organic solvent and in the presence of a strong base.

4,049,670
N-(2-ETHYLSULFONYL-1,3,4-THIADIAZOL-5-YL)-N-METHYL-N'-METHYLUREA

Carl Metzger, Wuppertal-Elberfeld; Ludwig Eue, and Helmuth Hack, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

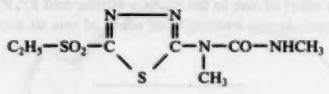
Division of Ser. No. 247,176, April 24, 1972, which is a continuation of Ser. No. 887,368, Dec. 22, 1969, abandoned. This application May 19, 1975, Ser. No. 579,124

Claims priority, application Germany, Dec. 23, 1968, 1816568

Int. Cl.[2] C07D *285/12*

U.S. Cl. 260—306.8 D 1 Claim

1. N-(2-ethylsulfonyl-1,3,4-thiadiazol-5-yl)-N-methyl-N'-methyl urea of the formula



4,049,671
PROCESS FOR PREPARING N-CYANOGUANIDINES

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, and George Raymond White, Harpenden, all of England, assignors to SmithKline & French Laboratories Limited, Welwyn Garden City, England

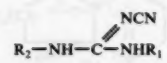
Filed Aug. 20, 1975, Ser. No. 606,268

Claims priority, application United Kingdom, Sept. 2, 1974, 38258/74

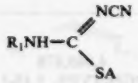
Int. Cl.[2] C07D *233/64, 277/38, 249/08, 211/94, 211/96, 211/82, 261/08, 263/32*

U.S. Cl. 548—342 8 Claims

1. In a process for the preparatin of a cyanoguanidine of the formula:



wherein R_1 is lower alkyl and R_2 is a grouping of structure Het-$(CH_2)_m$Z(CH_2)n — wherein Het is an imidazole, pyridine, thiazole, isothiazole, oxazole, isoxazole, triazole or thiadiazole ring, which ring is optionally substituted by lower alkyl, hydroxyl, halogen or amino; Z is sulphur, oxygen or a methylene group; and *m* is 0, 1 or 2 and *n* is 2 or 3, such that the sum of *m* and *n* is from 2 to 4; in which an isothiourea of the formula:



wherein R_1 and A, which may be the same or different, are lower alkyl, is treated with an amine of formula R_2NH_2 wherein R_2 has the same significance as hereinabove, the improvement wherein the reaction is carried out using a suitable heavy metal salt.

4,049,672
4-METHYL-5-IMIDAZOLYLMETHYLTHIOETHYLAMINE AND -S-METHYLISOTHIOUREA

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to SmithKline & French Laboratories Limited, Welwyn Garden City, England

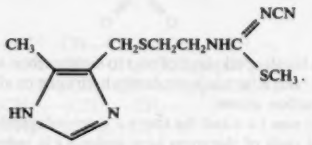
Division of Ser. No. 450,957, March 14, 1974, Pat. No. 3,950,333, which is a continuation-in-part of Ser. No. 290,584, Sept. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,451, Feb. 29, 1972, abandoned. This application Mar. 17, 1976, Ser. No. 667,738

Claims priority, application United Kingdom, Mar. 9, 1971, 6352/71

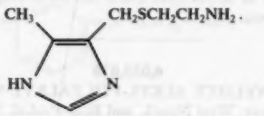
Int. Cl.[2] C07D *233/64*

U.S. Cl. 548—342 2 Claims

1. A compound of the formula:



2. A compound of the formula:



4,049,673
PREPARATION OF FERROUS HEMOGLOBIN AND ENZYMATIC DIGESTION PRODUCTS THEREOF ACTIVE FOR ABSORPTION OF CARBON MONOXIDE

Israel Herbert Scheinberg, 5447 Palisade Ave., Bronx, N.Y. 10471

Continuation-in-part of Ser. No. 151,153, June 8, 1971, abandoned, and Ser. No. 102,869, Dec. 30, 1970, Pat. No. 3,693,327, which is a continuation-in-part of Ser. No. 85,057, Oct. 29, 1970, abandoned. This application Sept. 25, 1972, Ser. No. 292,011

Int. Cl.[2] C09B *47/00*

U.S. Cl. 260—314 21 Claims

1. Method of producing ferrous hemoglobin from an aqueous solution of hemoglobin wherein said solution is to be exposed to a limited quantity of oxygen during production of said ferrous hemoglobin, comprising the steps of adding during agitation of said solution a buffer under conditions such as to maintain said solution at a pH between about 6.0 and 8.5 both locally and overall, and during addition of reductant and adding to said solution a quantity of an effective reductant sufficient to substantially prevent the inactivation of said hemoglobin for the absorption of CO by said limited quantity of oxygen.

4,049,674
SULFOLANYL-BEARING ORGANOSILICONE POLYMERS

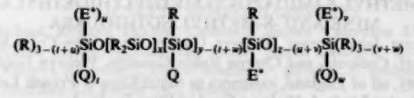
Bernard Kanner, West Nyack, and Bela Prokai, Mahopac, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 592,129

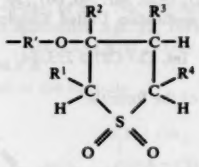
Int. Cl.[2] C07D *333/48*; C08J *9/00*

U.S. Cl. 260—332.1 45 Claims

1. A sulfolanyloxyalkyl-substituted organosiloxane having the average composition,



wherein: R is alkyl having from one to ten carbon atoms; E* is hydrogen or a polyoxyalkylene block; Q is a sulfolanyloxyalkyl group having the formula,



where R′ is bivalent alkylene of two to eight carbon atoms, and R^1, R^2, R^3 and R^4 are independently hydrogen or alkyl of one to four carbon atoms;

t, u, v, w, the sum t+u and the sum *v*+*w* are independently zero or one, and each of the sums *t*+*w* and *u*+*v* is independently zero, one or two; *x* is zero or a positive number having an average value up to about 200; *y* has an average value value from about 2 to about 100; and *z* has an average value from about 2 to about 30.

4,049,675

SULFOLANYLOXY ALKYL-POLYALKYL-SILOXANES

Bernard Kanner, West Nyack, and Bela Prokai, Mahopac, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

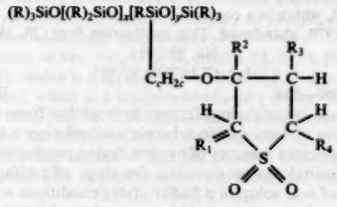
Filed June 30, 1975, Ser. No. 592,128

The portion of the term of this patent subsequent to Sept. 14, 1993, has been disclaimed.

Int. Cl.² C07D *333/48;* C08J *9/00*

U.S. Cl. 260—332.1 **11 Claims**

1. Sulfolanyloxyalkyl-polyalkylsiloxanes having the average composition,



wherein:

R is alkyl of one to four carbon atoms;

c has a value from two to eight;

x has an average value from about 0.5 to about 10;

y has an average value from about 0.5 to about 10; and R′, R^2, R^3 and R^4 are independently hydrogen or alkyl having from one to four carbon atoms

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4,049,676

SULFOLANYLOXYALKYL CYCLIC POLYSILOXANES

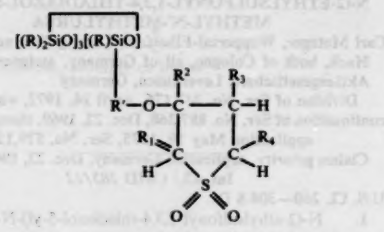
Curtis Louis Schilling, Jr., Croton-on-Hudson, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 592,092

Int. Cl.² C07D *333/48;* B01F *17/00*

U.S. Cl. 260—332.1 **6 Claims**

1. Sulfolanyloxyalkylheptaalkylcyclotetrasiloxanes having the general formula,



wherein: —R′— is bivalent alkylene of two to eight carbon atoms; R is alkyl of one to ten carbon atoms; and R^1, R^2, R^3 and R^4 are independently hydrogen or alkyl of one to four carbon atoms.

4,049,677

STEREOSPECIFIC TOTAL STEROIDAL SYNTHESIS VIA SUBSTITUTED C/D-TRANS INDANONES

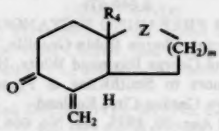
Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 482,711, June 24, 1974, Pat. No. 3,984,473, which is a division of Ser. No. 765,023, Oct. 4, 1968, Pat. No. 3,897,460. This application July 14, 1976, Ser. No. 705,309

Int. Cl.² C07D *317/72*

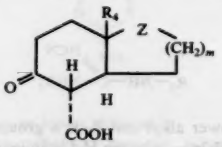
U.S. Cl. 260—340.9 AS **1 Claim**

1. A process for the preparation of a compound of the formula



wherein R_4 is hydrogen or lower alkyl; Z is lower alkylenedioxymethylene; *m* is an integer having the value of 1 or 2,

which comprises dissolving a compound of the formula



wherein R_4, Z and *m* are as defined above

in a dimethylsulfoxide solvent and then adding to the reaction mixture formaldehyde in the presence of a compound selected from the group consisting of a primary amine and secodary amine and salts thereof.

4,049,678

9-DEOXY-PGD-TYPE, 1,15-LACTONES

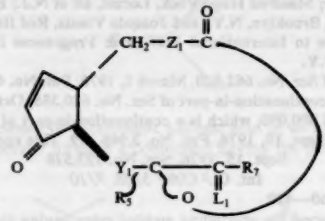
David C. Peterson, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

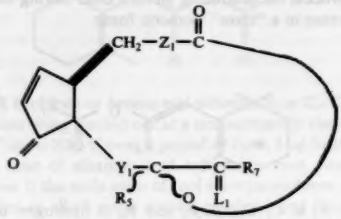
Filed Mar. 29, 1976, Ser. No. 670,525

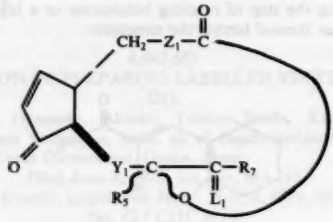
Int. Cl.² C07D *313/00*

U.S. Cl. 260—343.41 **41 Claims**

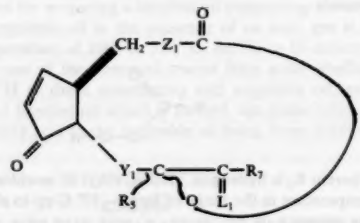
1. A prostaglandin-type, 1,15-lactone of the formula







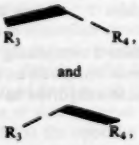
or



wherein L_1 is

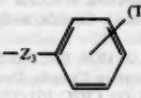
or a mixture of

and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro, only when the other is hydrogen or fluoro; wherein R_5 is hydrogen or methyl;

wherein R_7 is $-(CH_2)_m-CH_3$, wherein m is one to 5, inclusive, cis—CH=CH—CH_2—CH_3, or



wherein

T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, s is zero, one, 2, or 3, and Z_3 is oxa or methylene, with the proviso that not more than two T's are other than alkyl, and the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different;

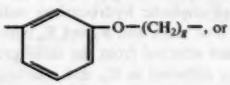
wherein Y_1 is trans—CH=CH—, $-CH_2CH_2-$, cis—CH=CH—, or —C≡C—; and

wherein

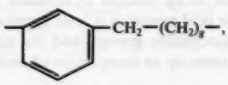
Z_1 is

1. cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
2. cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
3. cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
4. $-(CH_2)_3-(CH_2)_g-CH_2-$,
5. $-(CH_2)_3-(CH_2)_g-CF_2-$,
6. $-CH_2-O-CH_2-(CH_2)_g-CH_2-$,

(7)



(8)



wherein g is one to 3, inclusive.

4,049,679

INSECTICIDAL O,S-DIHYDROCARBYL-N-HALOACYLPHOSPHOROAMIDOTHIOATES AND S,S-DIHYDROCARBYL-N-HALOACYLPHOSPHOROAMIDODITHIOATES

Philip S. Magee, Ignacio, Calif., assignor to Chevron Research Company, San Francisco, Calif.

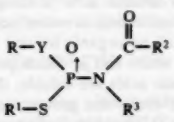
Continuation-in-part of Ser. No. 13,846, Feb. 24, 1972, Pat. No. 3,716,600, which is a continuation-in-part of Ser. No. 810,383, March 25, 1969, abandoned. This application Dec. 21, 1972, Ser. No. 317,316

The portion of the term of this patent subsequent to Feb. 13, 1990, has been disclaimed.

Int. Cl.[2] C08M *3/00, 9/02*

U.S. Cl. 260—402.5 **8 Claims**

1. A compound of the formula



wherein R and R^1 individually are alkyl, alkenyl or alkynyl of up to 6 carbon atoms and R^2 is haloalkyl of 1 to 18 carbon atoms and of 1 to 4 fluorine, chloride or bromine atoms, R^3 is hydrogen or alkyl of 1 to 6 carbon atoms and Y is oxygen or sulfur.

4,049,680

AMIDE WAXES

John Blachford, Westmount, Canada, assignor to H. L. Blachford Limited, Canada

Filed Dec. 3, 1974, Ser. No. 529,102
Claims priority, application Canada, Dec. 20, 1973, 188624
Int. Cl.[2] C11C 3/00; C07C 103/10; C08L 91/00
U.S. Cl. 260—404.5 24 Claims

1. A process for preparing organic amide waxes having at least two amide groups of formula —CO—NH— per molecule derived from reaction between carboxylic acid groups and isocyanate groups, which comprises heating to an elevated temperature at least one monocarboxylic acid of the formula R_1—COOH wherein R_1 is a linear or branched, saturated or unsaturated aliphatic hydrocarbon radical of 5 to 21 carbon atoms, introducng to the acid at least one organic isocyanate having the general formula

NCO-R_2—A

wherein R_2 is selected from the group consisting of straight chained, branch chained and cyclic aliphatic hydro-carbon radicals of at least 6 carbon atoms, and aromatic hydrocarbon radicals; wherein the aliphatic or aromatic hydrocarbon radical may be unsubstituted or substituted with one or more of lower alkyl of 1 to 8 carbon atoms, lower alkoxy of 1 to 8 carbon atoms, aryl and halogen; and A is selected from —NCO and —Alk—(NCO—R_3—CH_2—)$_n$—R_4—NCO wherein Alk is a single bond or an aliphatic hydrocarbon radical of 1 to 4 carbon atoms, n is 0 or more and R_3 and R_4 which may be the same or different are selected from the same group as R_2 and may be the same or different as R_2, and reacting the acid and isocyanate together with elimination of carbon dioxide, said acid and isocyanate being reacted in amounts such that the number of carboxlic acid groups is at least approximately equal to the number of isocyanate groups, and the carboxylic acid groups are in an excess up to completion of amide group formation.

4,049,681

PROCESSES FOR THE SEPARATION OF POTASSIUM SALTS OF PERFLUOROALKANOIC ACIDS FROM AQUEOUS SOLUTIONS THEREOF

Peter Dietrich; Gunter Engler, both of Berlin; Armin Ferse; Harald Grimm, both of Dresden; Udo Gross, Berlin; Klaus Lunkwitz, Dresden; Dietrich Prescher, Berlin; Jürgen Schulze, Berlin, and Astrid Wallbraun, Berlin, all of Germany, assignors to Akademie der Wissenschaften der D D R, Berlin-Adlershof, Germany

Filed Dec. 18, 1975, Ser. No. 641,919
Int. Cl.[2] C09F 7/00; C11C 3/00
U.S. Cl. 260—408 13 Claims

1. A process for the separation of a potassium salt of a perfluoroalkanoic acid having at least 1 and at most 12 carbon atoms per molecule or a mixture of potassium salts of a homologous mixture of the said perfluoroalkanoic acids from an aqueous solution that also contains a substantial proportion of one or more water-soluble salts of inorganic acids, which process comprises extracting at room temperature the said aqueous solution with an organic solvent that is at least partially miscible with water and in which potassium salts of the said perfluoroalkanoic acids are soluble, the said organic solvent being selected from the group consisting of alkanols having at least 3 and at most 5 carbon atoms per molecule, ketones having at least 3 and at most 7 carbon atoms per molecule, N,N-dimethylformamide, and dimethyl sulfoxide, and subsequently recovering the potassium salt of the perfluoroalkanoic acid or mixture of potassium salts of the homologous mixture of perfluoroalkanoic acids from the extract.

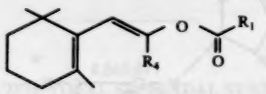
4,049,682

PROCESSES FOR PREPARING ENOL ESTERS

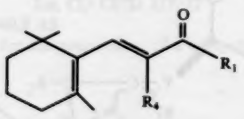
Alan Owen Pittet, Atlantic Highlands; Erich Manfred Klaiber, Neptune; Manfred Hugo Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y., and Joaquin Vinals, Red Bank, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 662,820, March 1, 1976, Pat. No. 4,000,329, which is a continuation-in-part of Ser. No. 620,355, Oct. 7, 1975, Pat. No. 4,000,090, which is a continuation-in-part of Ser. No. 507,412, Sept. 19, 1974, Pat. No. 3,940,499. This application Sept. 15, 1976, Ser. No. 723,528
Int. Cl.[2] C09F 5/08, 7/10
U.S. Cl. 260—410 6 Claims

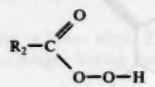
1. A process for producing an enol ester having the following structure in a "trans" isomeric form:



wherein R_1 is C_1–C_{11} alkyl, and R_4 is hydrogen or methyl comprising the step of reacting betaionone or a higher alkyl homologue thereof having the structure:



with a peralkanoic acid or m-chloroperbenzoic acid having the formula:



wherein R_2 is hydrogen, methyl, ethyl or m-chlorophenyl at a temperature in the range of from −10° C up to about 75° C in the presence of

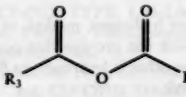
i. A buffer selected from the group consisting of alkali metal salts of lower alkanoic acids and alkali metal carbonates; and

ii. A solvent selected from the group consisting of methylene chloride, acetic acid, formic acid, propionic acid, benzene, cyclohexane, formamide and chloroform,

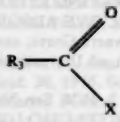
and substantially in the absence of solvents reactive with (i) said peralkanoic acid or (ii) said m-chloroperbenzoic acid, thereby forming the said enol ester.

2. The process of claim 1, wherein R_1 is methyl and R_4 is hydrogen.

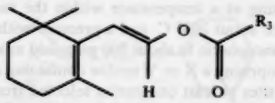
3. The process of claim 2 comprising the additional step of reacting the resulting enol ester with an acylating agent which is one of an alkanoic acid anhydride having the formula:



or an acyl halide having the general formula:



in the presence of paratoluene sulfonic acid or an alkali metal acetate thereby forming a compound having the formula:



wherein X is chloro or bromo and wherein R_3 is C_2–C_{11} alkyl, said reaction being carried out at a temperature in the range of from 100° up to 200° C over a period of from 3 up to 10 hours, the mole ratio of alkanoic acid anhydride: enol ester being greater than 1; the mole ratio of enol ester:paratoluene sulfonic acid catalyst or alkali metal acetate catalyst being from 1:0.01 up to 1:0.5.

4,049,683

METHOD OF PREPARING LABELLED VEGETABLE OIL

Hiroyuki Okamoto, Akashi; Yoshio Tsuda, Kyoto, and Kazumasa Yokoyama, Suita, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed June 3, 1975, Ser. No. 583,293

Claims priority, application Japan, Nov. 6, 1974, 49-127701

Int. Cl.[2] C11C *3/10*

U.S. Cl. 260—410.7 **10 Claims**

1. A method for preparing a labelled oil comprising transesterifying a vegetable oil in the presence of an inert gas at a reaction temperature of 260° to 320° C. for 30 to 60 minutes with at least one of the chemically-same fatty acids labelled with ^{14}C or ^{3}H as those constituting said vegetable oil, and recovering the labelled oil which is formed, the molar ratio of the labelled fatty acid to the vegetable oil being from 1:100 to 1:10,000.

4,049,684

PROCESS FOR THE SEPARATION OF FAT FROM ANIMAL SKINS

Archie Rae McFarland, Sandy, Utah, assignor to Beehive Machinery Inc., Sandy, Utah

Filed Sept. 8, 1975, Ser. No. 611,314

Int. Cl.[2] C11B *1/06*

U.S. Cl. 260—412 **10 Claims**

1. A process of producing a fat product and a separate gelatin product from the skins of slaughtered animals without the application of heat, comprising comminuting said skins in substantially raw condition to provide fragments no greater than about two inches in maximum dimension; applying screw pressure to the fragments against one side of a perforated plate with sufficient force to dislodge solid fat from the fragments and to force the dislodged fat through the perforations of said plate substantially free of skin material; collecting the so-dislodged and so-forced fat at the opposite side of said plate; and separately collecting, as gelatin stock, the residual skin material that remains at the said one side of said plate.

2. A process in accordance with claim **1**, wherein the perforated plate is in the form of a tubular conduit, the fragments of comminuted skin are fed into the conduit adjacent to one end thereof, a conveyor screw within the conduit carries the skin fragments from the said one end of the conduit toward the opposite end thereof during the pressing procedure; and the residual skin material is discharged substantially free of fat at the opposite end of the conduit.

10. A process in accordance with claim **2**, wherein the residual skin material is compacted adjacent the opposite end of the conduit immediately prior to discharge.

4,049,685

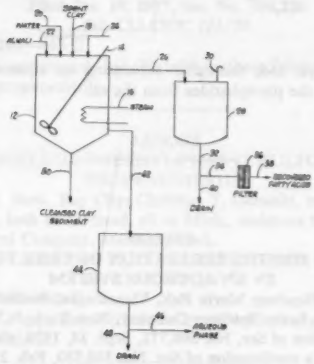
PROCESS FOR CLEANSING SPENT CLAY

Gary W. Smith, Lynn Haven; Dwight E. Leavens, Panama City, and Louis Ray Sims, Pensacola, all of Fla., assignors to Sylvachem Corporation, Jacksonville, Fla.

Filed Feb. 25, 1976, Ser. No. 661,257

Int. Cl.[2] C11B *13/04*

U.S. Cl. 260—412.5 **6 Claims**



1. In a process for cleansing fatty acids from spent crystalline clay wherein said spent clay is slurried and, in at least a primary wash stage, washed with aqueous alkali at elevated temperature for forming a cleansed clay sediment and recovering fatty acid, the improvement which comprises:

establishing and maintaining the mixture of aqueous phase and fatty acid in said primary wash stage at a pH between about 5 and about 6.5.

3. The process of claim **1** wherein said fatty acid is fluent at the conditions of the primary wash stage and monomeric, polymeric, a distilled tall oil, or a mixture of two or more of these fatty acids.

4,049,686

DEGUMMING PROCESS FOR TRIGLYCERIDE OILS

Hendrik Johan Ringers, Rotterdam, and Jacobus Cornelis Segers, Nieuwerkerk, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 10, 1976, Ser. No. 665,526

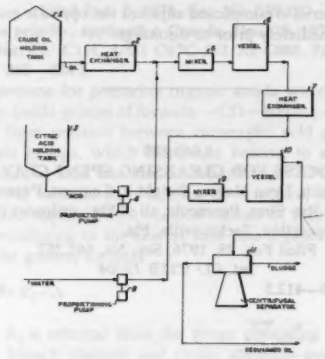
Claims priority, application United Kingdom, Mar. 10, 1975, 9862/75

Int. Cl.[2] C11B *3/04*

U.S. Cl. 260—424 **16 Claims**

1. A process for removing phosphatides from triglyceride oils which are substantially liquid at 40° C comprising the steps of dispersing an acid or acid anhydride in the oil, said acid or acid anhydride having a pH of from 0.5 to 7 as measured at 20° C in a one molar aqueous solution and said oil being at a temperature of from 20° to 100° C; adjusting the temperature of the mixture to the range of from the lowest temperature at which the oil remains a liquid to 40° C; dispersing from 0.2 to 5 per-

cent by weight of water in the mixture; maintaining the temperature of the mixture of oil, acid and water from 5 minutes to



several days; and, thereafter separating an aqueous sludge containing the phosphatides from the oil.

4,049,687

PROCESS FOR THE SEPARATION OF TRIGLYCERIDES IN AN AQUEOUS SYSTEM

Johannes Henricus Maria Rek, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 508,772, Sept. 24, 1974, abandoned, which is a continuation of Ser. No. 334,533, Feb. 22, 1973, abandoned. This application Dec. 9, 1975, Ser. No. 639,153

Claims priority, application United Kingdom, Feb. 24, 1972, 8647/72; Feb. 24, 1972, 8648/72; Sept. 12, 1972, 42393/72; Sept. 12, 1972, 42397/72

Int. Cl.² C11B *7/00, 3/00*

U.S. Cl. 260—428 **4 Claims**

1. A process for the separation of a mixture of liquid and crystalline fatty acid triglycerides of different melting points, the process comprising the steps in the following order:

a. contacting the glyceride mixture, at a temperature at which all the triglycerides thereof are liquid, with a mixture of oil-soluble and water-soluble surface-active agents which is sufficient to decrease the surface-tension at the triglyceride-aqueous interface of the triglycerides in contact with water to a value below 0.5 dyne/cm at the separation temperature, said oil-soluble surface-active agent selected from the group consisting essentially of oleoyl, linoleoyl and linolenoyl monoglycerides and the water-soluble surface-active agent selected from the group consisting essentially of an alkali metal decyl sulphate, an alkali metal salt of a C_{6-10} saturated fatty acid or a C_{12-28} unsaturated fatty acid;

b. crystallizing the triglycerides at the temperature at which separation is effected and the liquid and crystalline fatty acid triglycerides to be separated coexist;

c. contacting the mixture of triglycerides and surface-active agents at the separation temperature with sufficient water to form a dispersion of the crystalline fraction in the water added in the form of about 1 to about 15% of an inorganic salt solution;

d. separating the liquid triglyceride fraction and the water containing the dispersed crystalline fraction, and

e. recovering the crystalline fraction therefrom, the oil-soluble surface-active agent and the water-soluble surfaceactive agent.

4,049,688

PROCESS FOR SEPARATING ESTERS OF FATTY ACIDS BY SELECTIVE ADSORPTION

Richard W. Neuzil, Downers Grove, and Armand J. deRosset, Clarendon Hills, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 2, 1976, Ser. No. 710,817

Int. Cl.² C11C *1/08*

U.S. Cl. 260—428 **29 Claims**

1. A process for separating an ester of an unsaturated fatty acid from a mixture comprising an ester of an unsaturated fatty acid and an ester of a saturated fatty acid which process comprises contacting at a temperature within the range of from about 20° C. to about 200° C. and a pressure within the range from about atmospheric to about 500 psig. said mixture with an adsorbent comprising a X or Y zeolite containing at exchangeable cationic sites at least one cation selected from the group consisting of cations of metals of Group IA of the Periodic Table of Elements and combinations thereof thereby selectively adsorbing said ester of an unsaturated fatty acid and thereafter recovering said ester of an unsaturated fatty acid.

4,049,689

METHOD FOR THE PREPARATION OF ALKYL TIN HALIDES

François Verbeek, Harmelen; Eric J. Bulten, Bilthoven, and Jan W. G. van den Hurk, Leusden, all of Netherlands, assignors to Commer S.r.l., Lodi (Mi), Italy

Filed Nov. 21, 1975, Ser. No. 634,255

Claims priority, application Netherlands, Nov. 22, 1974, 7415247

Int. Cl.² C07F *7/22*

U.S. Cl. 260—429.7 **11 Claims**

1. A method for the preparation of alkyl tin halides by heating at raised temperature a reaction mixture of metallic tin and an alkyl halide under the influence of a liquid acid amide compound and of iodine and/or iodide as a catalyst, wherein the alkyl halide is fed in such a way gradually to the gas space over the reaction mixture that the reaction proceeds at substantially atmospheric pressure and no more than a few centimeters mercury overpressure, and the liquid acid amide compound is present in quantities of 0.65 to 2.3 mol per gram atom of tin.

4,049,690

METHOD OF PREPARING β-CHLOROETHYLTRICHLOROSILANE

Claus-Dieter Seiler, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Dec. 2, 1975, Ser. No. 636,880

Claims priority, application Germany, Dec. 24, 1974, 2461480

Int. Cl.² C07F *7/08, 7/12*

U.S. Cl. 260—448.2 E **6 Claims**

1. In a process for the hydrochlorination of vinyltrichlorosilane with HCl to prepare β-chloroethyltrichlorosilane wherein the reaction is carried out in the presence of a Lewis acid catalyst at an elevated temperature, the improvement which comprises carrying out the process at a temperature between 30° and 65° C, at a pressure of 740–790 mm Hg while employing a concentration of catalyst in the range of 1.0 to 15% by weight, based upon the amount of vinyltrichlorosilane charged.

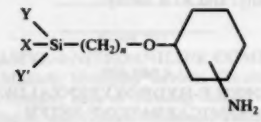
4,049,691

AROMATIC AMINO SILANES AND THEIR POLYMERS

Francois Meiller, Palaiseau, France, assignor to Rhone-Progil, Courbevoie, France

Continuation of Ser. No. 494,780, Aug. 5, 1974, abandoned. This application Sept. 20, 1976, Ser. No. 725,097
Claims priority, application France, Aug. 17, 1973, 73.29950
Int. Cl.² C07F 7/10
U.S. Cl. 260—448.2 N 9 Claims

1. Polymers and copolymers formed of monomers at least one of which is an aromatic amino silane having the formula



in which n is an integer with a value from 2 to 4, X represents a linear or branched alkoxy group having 1 to 8 carbon atoms, Y and Y', which may be identical or different from each other, represent a group selected from the group consisting of methyl, ethyl, phenyl, and a linear or branched alkoxy group having from 1 to 8 carbon atoms, other groups present in a copolymer being derived from monomers in the form of organo silanes having from 1 to 3 alkoxy groups attached to the silicon atom and associated with methyl, ethyl or phenyl groups on the silicon atom.

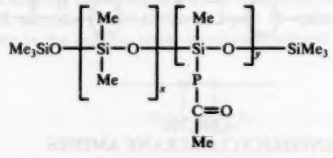
4,049,692

STABILIZED BLOOD SEPARATING COMPOSITION

Anthony R. Zine, Jr., Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 16, 1974, Ser. No. 532,946
Int. Cl.² C07F 7/08
U.S. Cl. 260—448.2 B 4 Claims

1. In a thixotropic composition useful as a chemical and physical barrier between serum and clot portions of separated blood, the composition comprising a gel-like material having a specific gravity within the range of about 1.030 to 1.090 and consisting of a dimethylsiloxane silicone fluid having an inert siliceous filler dispersed therein, the improvement which comprises the addition of a network former in a quantity sufficient to maintain the viscosity of the composition within the range of 200,000 to 600,000 centistokes for prolonged periods of time, the network former consisting of a polysiloxane-polyoxyalkyl copolymer represented by the following formual



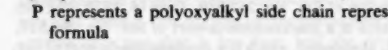
where the monomeric units are randomly distributed and

Me represents $-CH_3$;

x represents a number between 80 and 120;

y represents a number between 8 and 12;

P represents a polyoxyalkyl side chain represented by the formula



where the monomeric units are randomly distributed and

m represents a number between 20 and 30; and

n represents a number between 1 and 30.

4,049,693

2-CHLORO-3-((4-(2,2-DICHLORO-1,1-DIFLUOROETHOXY)PHENYL)SULFONYL)PROPANENITRILE

George A. Burk, Bay City; Christian T. Goralski, and Craig E. Mixan, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 10, 1977, Ser. No. 758,284
Int. Cl.² C07C 121/75
U.S. Cl. 260—465 F 1 Claim

1. 2-Chloro-3-((4-(2,2-dichloro-1,1-difluoroethoxy)phenyl)-sulfonyl)propanenitrile.

4,049,694

3-(4-(((TRICHLOROETHENYL)THIO)PHENYL)SULFONYL)-2-PROPENENITRILE

George A. Burk, Bay City; Christian T. Goralski, and Craig E. Mixan, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 10, 1977, Ser. No. 760,220
Int. Cl.² C07C 121/70
U.S. Cl. 260—465 G 1 Claim

1. The compound 3-(4-(((trichloroethenyl)thio)phenyl)sulfonyl)-2-propenenitrile.

4,049,695

3-((3-TRIFLUOROMETHYL)PHENYL)SULFONYL)-2-PROPENENITRILE

George A. Burk, Bay City; Christian T. Goralski, and Craig E. Mixan, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 10, 1976, Ser. No. 749,483
Int. Cl.² C07C 121/70
U.S. Cl. 260—465 G 1 Claim

1. The compound 3-((3-(trifluoromethyl)-phenyl)sulfonyl)-2-propenenitrile.

4,049,696

3-((4-(2,2-DICHLORO-1,1-DIFLUOROETHOXY)-PHENYL)SULFONYL)-2-PROPENENITRILE

George A. Burk, Bay City; Christian T. Goralski, and Craig E. Mixan, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 10, 1977, Ser. No. 758,281
Int. Cl.² C07C 121/75
U.S. Cl. 260—465 F 1 Claim

1. The compound 3-((4-(2,2-dichloro-1,1-difluoroethoxy)-phenyl)sulfonyl-2-propenenitrile.

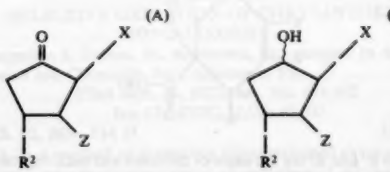
4,049,697

(DL)-13-SUBSTITUTED SULFINYL-PROSTAGLANDIN-LIKE COMPOUNDS AND METHODS OF MAKING

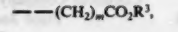
Karl G. Untch, Los Altos, Calif., and Gilbert J. Stork, New York, N.Y., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 476,362, June 5, 1974, Pat. No. 3,970,685. This application Apr. 5, 1976, Ser. No. 673,846
Int. Cl.² C07C 177/00
U.S. Cl. 560—118 3 Claims

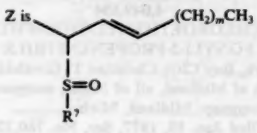
1. The (dl) compounds of the formulas:



wherein
R^2 is hydrogen or hydroxyl;

X is or  ,

in which
R^3 is hydrogen or alkyl containing from one through three carbon atoms, and m is a whole integer from two through eight;

Z is 

wherein R^7 is alkyl containing from one through six carbon atoms, cycloalkyl containing from five through seven carbon atoms, chloromethyl, trichloromethyl, trifluoromethyl, chlorodifluoromethyl, dichlorofluoromethyl, β-chloroethyl, α-chloroethyl, or α-chloro-β-trichloroethyl, and m is defined as above; and the wavy line (ξ) represents the α or β configuration or mixtures thereof; and the non-toxic, pharmaceutically acceptable salts of the compounds of Formulas (A) and (B) when R^3 is hydrogen.

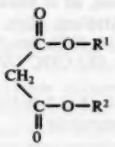
4,049,698

PROCESS FOR PRODUCING METHYLENE MALONIC ESTERS

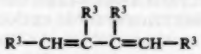
Gary Fred Hawkins, and Robert Lee Gass, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1976, Ser. No. 711,924
Int. Cl.² C07C *69/74, 67/30*
U.S. Cl. 560—127 **8 Claims**

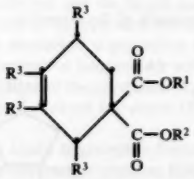
1. A process comprising
A. reacting an ester of malonic acid having the formula



with formaldehyde and a diene having the formula

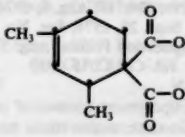


in the presence of a catalyst selected from primary, secondary and tertiary amines at about reflux temperature to form a compound having the formula



wherein R^1 and R^2 are the same or different and each represents alkyl of 1 to about 10 carbon atoms, cyclohexyl or alkenyl of 2 to about 4 carbon atoms and each R^3 is the same or different and represents hydrogen, methyl or ethyl.

8. A compound having the formula



wherein R^1 is allyl and R^2 is methyl.

4,049,699

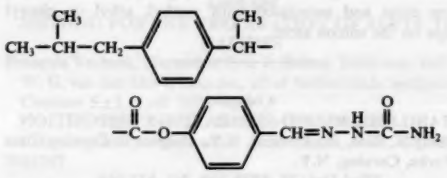
IBUPROFEN P-HYDROXYBENZALDEHYDE SEMICARBAZONE ESTER

Anthony A. Sinkula, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed June 17, 1976, Ser. No. 696,891
Int. Cl.² C07C *133/08*
U.S. Cl. 560—105 **1 Claim**

1. Ibuprofen p-hydroxybenzaldehyde simicarbazone ester formula II:

II



4,049,700

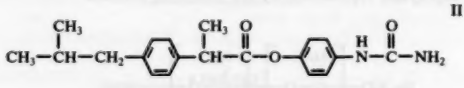
IBUPROFEN P-HYDROXYPHENYLUREA ESTER

Anthony A. Sinkula, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed June 17, 1976, Ser. No. 696,947
Int. Cl.² C07C *127/19*
U.S. Cl. 560—105 **1 Claim**

1. Ibuprofen p-hydroxyphenyurea ester having the formula II:

II



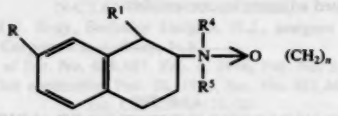
4,049,701

BENZOBICYCLOALKANE AMINES

Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 553,418, Feb. 26, 1975, Pat. No. 3,957,872, which is a division of Ser. No. 421,375, Dec. 3, 1973, abandoned, which is a division of Ser. No. 262,849, June 14, 1972, Pat. No. 3,836,670, which is a continuation-in-part of Ser. No. 200,517, Nov. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 94,983, Dec. 3, 1970, abandoned. This application Dec. 15, 1975, Ser. No. 640,521
Int. Cl.² C07C *67/08*
U.S. Cl. 560—130 **4 Claims**

1. A compound of the formula:



wherein R is aliphatic carboxylic acyloxy of from 2 to 4 carbon atoms; R^1 is lower alkyl or phen(lower)-alkyl; R^4 is lower alkyl; R^5 is lower alkyl; and n is an integer from 2 to 6; and the pharmaceutically non-toxic addition salts thereof.

4,049,702

γ-GLUTAMYL-4-NITROANILIDE COMPOUNDS

Erich Bernt, Munich; Wolfgang Gruber, Garatshausen; Erich Haid; Fritz Stahler, both of Tutzing; August Wilhelm Wahlefeld, Weilheim, and Gunter Weimann, Tutzing, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

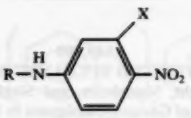
Division of Ser. No. 419,455, Nov. 27, 1973, Pat. No. 3,979,447. This application June 23, 1975, Ser. No. 589,653

Claims priority, application Germany, Dec. 5, 1972, 2259512; July 3, 1973, 2333798

Int. Cl.² C07C *143/67*

U.S. Cl. 260—501.12 **7 Claims**

1. γ-Glutamyl-4-nitroanilide compound of the formula



wherein R is a γ-glutamyl radical and X is a sulfonic acid group or a thiosulfonic acid group and alkali, alkaline earth, ammonium and amine salts thereof.

4,049,703

PROCESS FOR THE PRODUCTION OF PURIFIED CAMPHORSULFONIC ACID SALTS

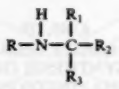
David R. Buss, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 18, 1969, Ser. No. 851,084

Int. Cl.² C07C *143/00*

U.S. Cl. 260—503 **7 Claims**

1. In a process of purifying an aqueous solution of a camphorsulfonic acid salt which comprises (a) mixing at a pH of 3–6 a dilute aqueous solution of the camphorsulfonic acid salt and a solution consisting of a water-immiscible organic solvent and a secondary amine that is liquid at room temperature, soluble in the organic water-immiscible solvent, and is the



wherein R is an aliphatic group having from 10 to 14 carbon atoms and R_1, R_2 and R_3 are each alkyl and wherein the combined carbon atoms in R_1, R_2 and R_3 total from 11 to 14, (b) separating the organic water-immiscible phase from the mixture, (c) mixing the organic water-immiscible phase with a volume of water that is less than half the original aqueous solution volume at a pH above 9 to form a second two-phase mixture, and (d) separating the aqueous phase from said two-phase mixture to provide a purified concentrated aqueous solution of the salt; the improvement consisting of sulfuric acid to control the pH of the mixture formed in Step (a).

4,049,704

2-AMINO-1-SULFONAPHTHALENE CONTAINING ACYLAMINOMETHYL SUBSTITUENT

Horst Jäger, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

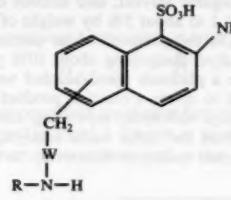
Division of Ser. No. 376,184, July 3, 1973. This application Feb. 9, 1976, Ser. No. 656,251

Claims priority, application Germany, July 3, 1972, 2232541

Int. Cl.² C07C *143/52, 143/56;* C09B *29/00, 63/00*

U.S. Cl. 260—507 R **3 Claims**

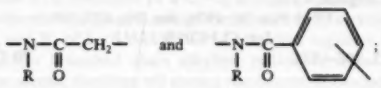
1. Aminonaphthalenesulphonic acid, which in the form of the free acid, corresponds to the formula



wherein

R is hydrogen or lower alkyl; and

W is a direct bond or a bridge member selected from the group consisting of



in which the N atoms of the bridge member is attached to —CH_2— group in the formula.

4,049,705

2-ALKYL-1-NAPHTHOL-4-SULFONIC ACIDS

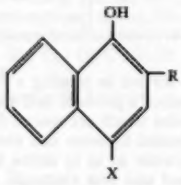
Gregory Wayne Schwing, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 1, 1976, Ser. No. 672,724

Int. Cl.² C07C *143/30*

U.S. Cl. 260—512 C **2 Claims**

1. A compound of the formula



wherein

R is alkyl of 11 to 14 carbon atoms, and

X is —SO_3H.

4,049,706

SELECTIVE OXIDATION OF CHRYSANTHEMYL ALCOHOL

Augustine I. Dalton, Jr., Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sept. 24, 1975, Ser. No. 616,405

Int. Cl.² C07C *51/26, 45/00*

U.S. Cl. 260—514 H **14 Claims**

1. In a method of producing chrysanthemyl aldehyde comprising selectively converting chrysanthemyl alcohol to the

corresponding aldehyde, the improvement which comprises contacting at a temperature in the range of 75° to 150° C the reactant alcohol dissolved in organic solvent, said alcohol being present in a range of about 2 to about 5% by weight of said solvent, with oxygen-containing gas in the presence of an amount of noble metal catalyst comprising about 10% platinum on carbon to provide a platinum metal/alcohol weight ratio of about 15% to 30% and recovering high yields of chrysanthemyl aldehyde.

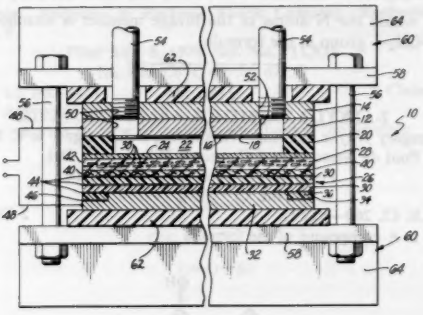
11. In a method of producing chrysanthemic acid which comprises selectively oxidizing chrysanthemyl alcohol to chrysanthemic acid, the improvement which comprises oxidizing at a temperature in the range of 75° to 150° C chrysanthemyl alcohol dissolved in organic solvent, said alcohol being present in a range of about 2 to about 5% by weight of said solvent, with free oxygen in the presence of an amount of supported noble metal catalyst comprising about 10% platinum on carbon to provide a platinum metal/alcohol weight ratio of about 15% to 30% to obtain a reaction product predominating in chrysanthemyl aldehyde, separating the obtained aldehyde product from the noble metal catalyst, and subjecting the same to further oxidation selectively to form chrysanthemic acid.

4,049,707

APPARATUS FOR FLUID TREATMENT BY CORONA DISCHARGE

Joseph William Harter, Los Angeles, and Stuart Wallace Beitzel, Santa Monica, both of Calif., assignors to O-3 Company, Los Angeles, Calif.

Filed Feb. 20, 1976, Ser. No. 659,929
Int. Cl.² C01B *13/11*
U.S. Cl. 250—531 **20 Claims**



1. An apparatus for use in treating a fluid by corona discharge so as to produce a product, said apparatus having first and second electrodes which are spaced from one another, a dielectric means located between said electrodes and spaced from said first electrode so as to define a gap between said dielectric means and said first electrode, sealing means surrounding the periphery of said gap and inlet and outlet means for use in circulating a fluid through said gap between said electrodes in which the improvement comprises:

said dielectric means consisting of at least one layer of a first dielectric material exposed to said gap and at least one layer of a second dielectric material located between said first dielectric material and said second electrode,

said layers and said dielectric means fitting closely against one another and against said second electrode so that there are no voids between said layers and between said dielectric means and said second electrode,

said first dielectric material including overlapping, flat, plate-like particles of an inert, inorganic dielectric composition,

said second dielectric material being different from said first dielectric material so as to minimize the possibility of flaws in said first and second dielectric materials being located adjacent to one another.

4,049,708

FLUORODESULFURIZATION OF ALKYL MERCAPTANS OR ALKYL DITHIANES

Janos Kollonitsch, Westfield, and Stephen Marburg, Metuchen, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 4, 1976, Ser. No. 663,586
Int. Cl.² C07C *101/10*; A61K *31/195*
U.S. Cl. 260—534 C **8 Claims**

1. The process for fluorodesulfurization of a reactant compound selected from the group consisting of D-cysteine, 2-deutero-D-cysteine, DL-cysteine, 2-deutero-DL-cysteine, L-cysteine, 2-deutero-L-cysteine, and 3-mercapto-D-valine, which comprises dissolving or suspending the compound in liquid hydrogen fluoride, liquid hydrogen fluoride containing boron trifluoride or liquid hydrogen fluoride containing antimony pentafluoride at −80° to 15° C. and introducing a molecular excess of a halogenating agent which is molecular fluorine, molecular chlorine, fluoroxyperfluoroalkanes of 1–4 carbon atoms, fluoroxytrifluoromethane, N-chloro-succinimide, or t-butyl hypochlorite, and recovering the product thereby produced.

4,049,709

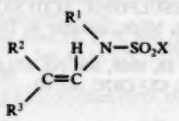
VINYL-SUBSTITUTED SULFAMIC ACID HALIDES

Gerhard Hamprecht, Mannheim, and Siegfried Kersten, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 22, 1976, Ser. No. 735,218
Claims priority, application Germany, Nov. 28, 1975, 2553461
Int. Cl.² C07C *143/86*
U.S. Cl. 260—543 R **4 Claims**

1. Sulfamic acid halides of the formula

I



where R^1 is an aliphatic or cycloaliphatic radical, R^2 and R^3 may be identical or different and each is hydrogen, halogen or an aliphatic radical and X is halogen.

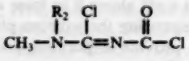
4,049,710

NOVEL CARBAMIMIDOYL CHLORIDES AND THEIR USE IN THE SYNTHESIS OF HERBICIDAL TRIAZINEDIONES

Stanley Tocker, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 24, 1976, Ser. No. 661,004
Int. Cl.² C07C *125/03*
U.S. Cl. 260—544 C **2 Claims**

1. A compound of the formula:



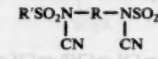
where R_2 is alkyl of 1 through 4 carbon atoms.

4,049,711
N-CYANOSULFONAMIDES

Raymond J. Kray, Berkeley Heights, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 439,487, Feb. 4, 1974, Pat. No. 3,944,526. This application Feb. 26, 1976, Ser. No. 661,468
Int. Cl.[2] C07C *125/08*
U.S. Cl. 260—551 C 8 Claims

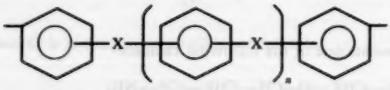
1. A bis-N-cyanosulfonamide of the formula



wherein

R′ is selected from the group consisting of phenyl, p-chlorophenyl, p-tolyl, 2-naphthyl, 2-anthracenyl, alkyl of 1 to 8 carbon atoms, cyclopentyl, cyclohexyl and trifluoromethyl, and

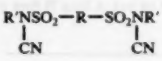
R is a divalent radical selected from the group consisting of phenylene, xylylene, diphenylene, naphthylene; any of said phenylene, xylylene, diphenylene and naphthylene substituted by chloro, bromo or fluoro groups; and



wherein

wherein *n* is zero to five and X is oxa, methylene, phenylimido, thio, sulfonyl, carbonyl or 2,2-propylidene.

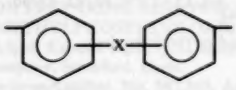
7. A bis-N-cyanosulfonamide of the formula



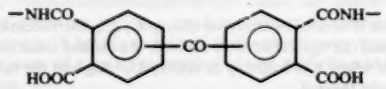
wherein

R′ is phenyl, and

R is a divalent radical selected from the group consisting of phenylene, xylylene, diphenylene, naphthylene; any of said phenylene, xylylene, diphenylene and naphthylene substituted by chloro, bromo or fluoro groups; and



where X is oxa, methylene, phenylimido, thia, sulfonyl, carbonyl, 2,2-propylidene,

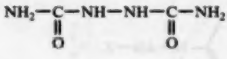


4,049,712
METHOD FOR MANUFACTURING HYDRAZODICARBONAMIDE

Jean-Pierre Schirmann, Brignais, and Francis Weiss, Pierre-Benite, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

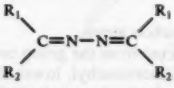
Filed June 23, 1972, Ser. No. 265,749
Claims priority, application France, June 25, 1971, 71.23198
The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.
Int. Cl.[2] C07C *133/02*; C01B *21/16*
U.S. Cl. 260—554 5 Claims

1. A method for preparing hydrazodicarbonamide



(I)

which comprises reacting at between about 50° and 150° C for a period of about 2–7 hours at atmospheric or subatmospheric pressure, urea, sulfuric acid, water and an azine of the formula



(II)

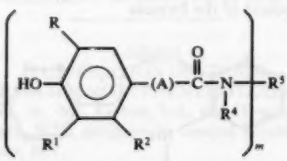
wherein R_1 is hydrogen or a C_1–C_6 alkyl, R_2 is a C_1–C_6 alkyl, and wherein said alkyl is straight or branched or a cycloalkyl, or R_1 and R_2 of both the >C=N— moieties together form a straight or branched chain alkylene radical of from 3 to 5 carbon atoms, distilling off during the course of reaction substantially all the ketone or aldehyde formed, and recovering the hydrazodicarbonamide which forms from the reaction medium, wherein the amounts of reactants used per mol of azine are about 2–10 mols urea, about 2–10 mols of water and about 1–10 mols of sulfuric acid.

4,049,713
ESTERS AND AMIDES OF TRISUBSTITUTED HYDROXYPHENYLALKANOIC ACIDS

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 490,835, July 23, 1974, Pat. No. 3,984,460, which is a continuation-in-part of Ser. No. 400,745, Sept. 25, 1973, abandoned. This application May 3, 1976, Ser. No. 682,237
Int. Cl.[2] C07C *103/26*
U.S. Cl. 260—559 R 18 Claims

1. A compound having the formula



wherein

R is a branched alkyl of 3 to 8 carbon atoms,

R^1 and R^2 are alkyl of 1 to 3 carbon atoms,

R^4 is hydrogen or alkyl of 1 to 4 carbon atoms,

R^5 is, when *m* is 1, alkyl of 1 to 18 carbon atoms, or when *m* is 2, alkylene of 2 to 12 carbon atoms or 3,6-dioxa-1,8-octamethylene,

A is a straight chain alkylene of 1 to 3 carbon atoms, and

m is an integer of 1 to 2.

4,049,714

N-PHENYL AMIDINES

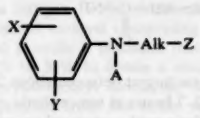
Yao Hua Wu, and Walter G. Lobeck, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 466,753, May 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 255,701, May 22, 1972, Pat. No. 3,816,454, which is a continuation-in-part of Ser. No. 47,589, June 18, 1970, abandoned. This application Sept. 2, 1975, Ser. No. 609,885

Int. Cl.[2] C07C *123/00*

U.S. Cl. 260—564 R **6 Claims**

1. A compound selected from the group consisting of N-phenyl amidines of Formula I



Formula I

and pharmaceutically acceptable acid addition salts of compounds of Formula I wherein

Alk is alkylene having 1 or 2 carbon atoms;

X and Y are independently selected from the group consisting of hydrogen, halogen, trifluoromethyl, lower alkoxy of from 1 to 4 carbon atoms inclusive, lower alkyl of from 1 to 4 carbon atoms inclusive;

Z is phenyl; and

A is —CH=N—R^1

wherein

R^1 is lower alkyl of from 1 to 4 carbon atoms inclusive.

4,049,715

3-[2-(4-ANISIDINO)PHENYL]-1-PHENYL-1-PROPIOPHENONES AND PROPANOLS

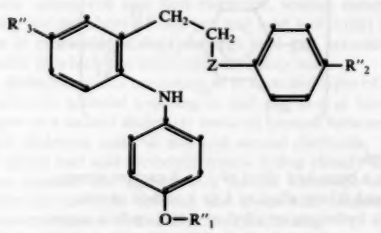
Malcolm R. Bell, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 402,162, Oct. 1, 1973, Pat. No. 3,994,902, which is a division of Ser. No. 156,070, June 23, 1971, Pat. No. 3,819,637. This application July 3, 1975, Ser. No. 593,166

Int. Cl.[2] C07C *93/14*

U.S. Cl. 260—571 **7 Claims**

1. A compound of the formula



where R''_1 is lower-alkyl or benzyl;

R''_2 is hydrogen, lower-alkoxy or halo;

R''_3 is hydrogen or lower-alkoxy;

and Z is carbonyl or hydroxymethylene.

4,049,716

COMPOSITIONS BASED ON POLYAMINES WITH ETHER GROUPS

Paul Collet, Saint-Fons, France, assignor to Rhone-Poulenc Industries, Paris, France

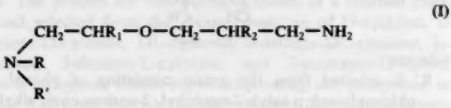
Filed Apr. 5, 1976, Ser. No. 673,993

Claims priority, application France, Apr. 18, 1975, 75.12135; Dec. 24, 1975, 75.39690

Int. Cl.[2] C07C *91/02, 91/06, 91/40, 93/02*

U.S. Cl. 260—573 **6 Claims**

1. Compositions based on polyamines with ether groups, characterized in that they contain at least one of the polyamines with ether groups of the formula:

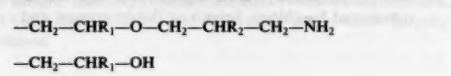


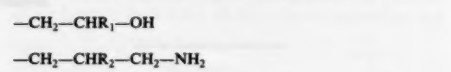
(I)

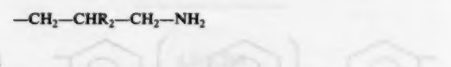
in which formula:

R_1 and R_2 are similar or different and represent a hydrogen atom or methyl radical,

R represents one of the following radicals:

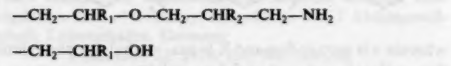


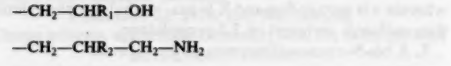


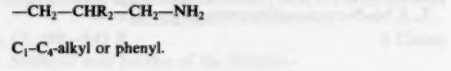


and

R′ represents one of the following radicals:







C_1–C_4-alkyl or phenyl.

4,049,717

NOVEL 1,2,3,4-TETRAHYDRO-4-OXO-(OXY)-1-NAPHTHYLAMINES AND METHOD OF PREPARATION THEREOF

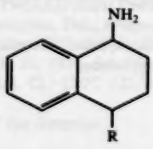
Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 13, 1976, Ser. No. 685,945

Int. Cl.[2] C07C *91/42, 87/66*

U.S. Cl. 260—575 **7 Claims**

1. A compound of the formula:



wherein R is oxo, hydroxy or alkoxy C_1–C_4; the racemic mixtures and the optical isomers thereof; the cis and trans isomers thereof when R is hydroxy or alkoxy C_1 - C_4; and the halogen acid salts thereof.

4,049,718

SULPHONES

Pierre Chabardes, Sainte Foy les Lyon; Marc Julia, Paris, and Albert Menet, La Mulatiere, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

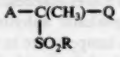
Division of Ser. No. 413,246, Nov. 6, 1973. This application Feb. 10, 1975, Ser. No. 548,787

Claims priority, application France, Nov. 8, 1972, 72.39513

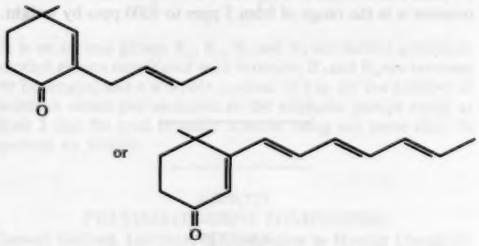
Int. Cl.[2] C07C *147/06*

U.S. Cl. 260—590 C 6 Claims

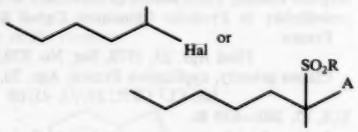
1. A sulphone of the formula:



in which R is substituted or unsubstituted aryl, A is



and Q is hydrogen or a radical of formula:



where Hal is halogen and R and A are as hereinbefore defined.

4,049,719

PROCESS FOR PREPARING BIS(HYDROXYMETHYL) METHYLPHOSPHINE OXIDE

John Harvey Bright, Kendall Park, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 567,565, April 14, 1975, abandoned. This application Oct. 15, 1976, Ser. No. 732,632

Int. Cl.[2] C07F *9/53*

U.S. Cl. 260—606.5 P 10 Claims

1. In a process for preparing bis(hydroxymethyl)-methylphosphine oxide which comprises heating tris(hydroxymethyl) phosphine to rearrange said tris(hydroxymethyl)phosphine to bis(hydroxymethyl)methylphosphine oxide, the improvement which comprises adding a catalytic amount of a strong non-oxidizing acid, having an ionization constant greater than 10^{-3}, or a source of a catalytic amount of said acid, thereto before heating.

4,049,720

PROCESS FOR PRODUCING β-ISOPROPYL-NAPHTHALENE HYDROPEROXIDE

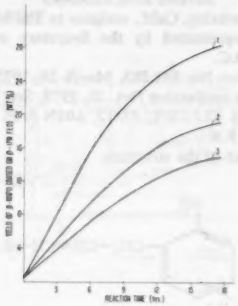
Hirokazu Hosaka; Kenji Tanimoto, both of Minoo, and Hiroshi Yamachika, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

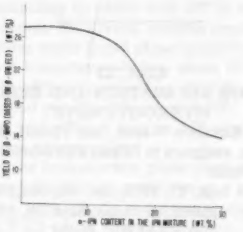
Filed Feb. 21, 1975, Ser. No. 551,812

Claims priority, application Japan, Feb. 21, 1974, 49-21140

Int. Cl.[2] C07C *179/02*

U.S. Cl. 260—610 B 4 Claims





1. In a process for the continuous production of β-isopropylnaphthalene hydroperoxide comprising oxidizing an isopropylnaphthalene mixture containing α- and β-isopropylnaphthalene isomers with molecular oxygen or a molecular oxygen containing gas at a temperature of about 70° to 120° C in an oxidation zone kept neutral to alkaline by adding an alkali selected from hydroxides, carbonates and bicarbonates of sodium and potassium until the isopropylnaphthalene hydroperoxide concentration reaches about 10 to 40% by weight and recycling unreacted isopropylnaphthalene recovered after the oxidation, wherein the α-isopropylnaphthalene content in the isopropylnaphthalene mixture continuously fed to the oxidation zone is controlled to be about 15% by weight or less.

4,049,721

PURIFICATION OF CRUDE 9,9-BIS-(4-HYDROXYPHENYL)-FLUORENE

John E. Corn, Jr., Mt. Vernon, Ind., and Howard J. Klopfer, Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 7, 1976, Ser. No. 720,744

Int. Cl.[2] C07C *37/24*

U.S. Cl. 260—619 A 2 Claims

1. The process for purifying crude 9,9-bis(4-hydroxyphenyl)-fluorene containing phenol as an impurity therein, which process comprises (1) mixing the aforesaid impure fluorene with an amount of methanol sufficient to solubilize all the impurity therein, (2) removing by filtration any solid material present in the aforesaid mixture, (3) adding water to the filtrate, (4) heating the mixture of the water and the filtrate to an

elevated temperature to effect solubilization of the suspended material present in (3), (5) cooling the mixture to precipitate essentially pure 9,9-bis(4-hydroxyphenyl)-fluorene, and (6) separating the latter from the liquid containing the impurity therein.

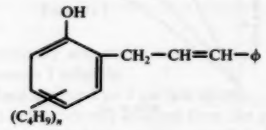
4,049,722

POLYBUTYL-2-CINNAMYLPHENOLS AS INSECT ANTI-PROCREANTS

Leonard Jurd, Berkeley, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 561,583, March 24, 1975, Pat. No. 3,959,489. This application Oct. 30, 1975, Ser. No. 627,327
Int. Cl.² C07C 37/12; A01N 9/26
U.S. Cl. 260—619 R 2 Claims

1. A compound of the structure



wherein n is 2 or 3.

4,049,723

METHOD FOR SEPARATION AND RECOVERING HYDROQUINONE

Seiichi Tanaka; Kazuhiro Watari, and Hideki Hayashi, all of Ohtake, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sept. 17, 1975, Ser. No. 614,156
Claims priority, application Japan, Sept. 20, 1974, 49-107665
Int. Cl.² C07C 39/08
U.S. Cl. 260—621 A 2 Claims

1. In a method for separating and recovering hydroquinone from a by-product-containing acid-cleavage product obtained by acid-cleavage of an oxidation product of para-diisopropyl benzene in method isobutyl ketone as a solvent, which comprises distilling said by-product-containing acid-cleavage product in the presence of an added aromatic hydrocarbon to remove low-boiling fractions, including the solvent, contacting the resultant hydroquinone-containing distillation bottoms with water, and crystallizing and separating hydroquinone, the improvement wherein

a. the distillation to remove the low-boiling fractions is effected without the addition of water and in the absence of an azeotropic amount of water, and also in the presence of about 15 to 100 parts by weight of an added aromatic hydrocarbon selected from the group consisting of cumene and cymene per 100 parts by weight of the hydroquinone,

b. the contact of the hydroquinone-containing distillation bottoms with water is effected under conditions such that the temperature of said bottoms is about 150 to 190° C, the water is used in an amount of about 100 to 5000 parts by weight per 100 parts by weight of the hydroquinone, and the hydroquinone in the hydroquinone-containing distillation bottoms is extracted into the water, thereby avoiding crystallization of the hydroquinone in the distillation bottoms, and, after the extraction, the mixture resulting from the extraction is separated into an aqueous phase and an oily phase, and the hydroquinone is separated from the aqueous phase.

4,049,724

OSMIUM CATALYZED ORGANIC HYDROPEROXIDE HYDROXYLATION OF OLEFINIC COMPOUNDS

Ming N. Sheng, Cherry Hill, N.J., and Walter A. Mameniskis, Drexel Hill, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 417,681, Nov. 20, 1973, abandoned. This application Oct. 7, 1975, Ser. No. 620,436
Int. Cl.² C07D 307/89; C11C 1/00; C07C 29/02
U.S. Cl. 260—635 H 7 Claims

1. A method for preparing polyols by the homogeneous catalytic hydroxylation of an olefinic compound selected from the group consisting of lower alkenes, allyl alcohol, oleic acid, and 1,2,3,6-tetrahydrophthalic anhydride by contacting said olefinic compound at a temperature in the range of from 25° to 55° C. with an organic hydroperoxide in an aqueous solution at an initial pH in the range of from 8 to 12 in the presence of a catalytic amount of a water soluble osmium compound in its + 8 valence state as the catalyst and wherein the concentration of osmium is in the range of from 5 ppm to 1000 ppm by weight.

4,049,725

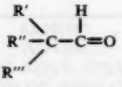
METHOD FOR PREPARING PRIMARY ALCOHOLS HAVING ALKYLS BRANCHED AT THE SECOND CARBON

Auguste Gueant, Lens, and Serge Mercier, Paris, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Apr. 23, 1975, Ser. No. 570,829
Claims priority, application France, Apr. 30, 1974, 74.14962
Int. Cl.² C07C 29/14, 45/08
U.S. Cl. 260—638 B 10 Claims

1. A method for preparing a primary alkyl alcohol branched at the second carbon atom which comprises reacting over a hydrogenation catalyst which is insensitive to carbon monoxide under the reaction conditions and which does not form metal carbonyls

a. an aldehyde, in the liquid phase, of formula



wherein R′ is H or alkyl and wherein R″ and R‴, and R′ when it is alkyl, are the same or different C_1–C_{20} straight or branched alkyl or alkenyl or wherein R″ and R‴ together may be a methylene or an alkyl-substituted methylene having the formula

wherein R_a and R_b, which can be the same or different, are H or C_1–C_{20} straight or branched alkyl or alkenyl, with

b. a hydrogen/carbon monoxide gas mixture having a molar ratio of about 2/1,

and continuing the reaction until the residual hydrogen/carbon monoxide molar ratio in the gas mixture reaches between about 1/1 and 1.5/1.

4,049,726
FIRE RETARDANT COMPOUNDS

Hendrik Harm Jannes Oosterwijk, Diepenveen; Ulfert Elle Wiersum, Velp; Eduard Pieter Magré, Heelsum, and Johannes Hendrinus van Dijk, Ede, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 4, 1974, Ser. No. 512,303

Claims priority, application Netherlands, Oct. 5, 1973, 7313979

Int. Cl.² C07C *25/18*

U.S. Cl. 260—649 R **4 Claims**

1. A brominated polydiisopropylarylene compound having a molecular structure of the following formula

A is an arylene group, R_1, R_2, R_3 and R_4 are methyl groups or methyl groups substituted with bromine, R_5 and R_6 are bromine or hydrogen, and *n* a whole number of 2 to 10, the number of bromine atoms per molecule in the aliphatic groups being at least 2 and the total bromine content being not more than 70 percent by weight.

4,049,727
POLYHALOINDENE COMPOUNDS

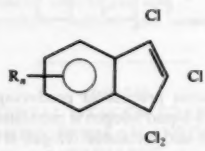
Samuel Gelfand, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 401,931, Sept. 28, 1973, abandoned. This application Sept. 10, 1975, Ser. No. 612,072

Int. Cl.² C07C *25/14*

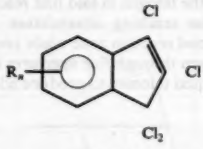
U.S. Cl. 260—650 R **12 Claims**

1. Compounds of the formula:

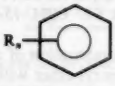


wherein R is independently selected from the group consisting of chlorine, bromine, fluorine, and lower alkyl and *n* is 2 to 4 providing when every R is chlorine, *n* is from 2–3.

5. A process for the preparation of compounds of the formula:



wherein each R is independently halogen or lower alkyl and *n* is 2 to 4, comprising reacting a substituted aromatic of the formula



wherein each R is independently selected from the group consisting of chlorine, bromine, fluorine and lower alkyl and *n* is from 2 to 4 providing there is unsubstitution on at least two adjacent carbon atoms of the aromatic, with hexachloropropylene in the presence of a catalytic amount of ferric chloride.

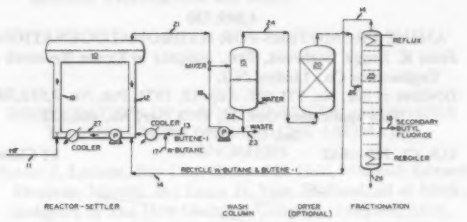
4,049,728
HYDROFLUORINATION PROCESS

Wayne P. Kraus, and Thomas Hutson, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 23, 1976, Ser. No. 669,538

Int. Cl.² C07C *19/08*

U.S. Cl. 260—653.6 **9 Claims**



1. A process for the production of high purity alkyl fluorides with minimum polymer and heavy oil formation which comprises:

a. hydrofluorinating an olefin with HF in a normal paraffin diluent wherein the normal paraffin contains from 3 to 6 carbon atoms under liquid phase hydrofluorination conditions and a temperature below about 80° F (26.7° C) to produce an effluent comprising alkyl fluoride, unreacted olefin, normal paraffin diluent, and HF;

b. separating said effluent into an HF phase portion and a hydrocarbon phase portion;

c. subjecting the hydrocarbon phase portion of said effluent to fractional distillation conditions at a pressure substantially below atmospheric and a temperature below about 80° F (26.7° C) which is sufficiently low to prevent polymer and heavy oil formation and to separate a first stream comprising alkyl fluoride and a second stream comprising unreacted olefin, and diluent; and

d. recycling said stream containing unreacted olefin and diluent to step (a) for reuse in the process.

4,049,729
CHLORINATION OF BUTADIENE

Kenneth Wayne Otto, Victoria, and Jimmy L. Hatten, Odessa, both of Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 17, 1969, Ser. No. 858,658

Int. Cl.² C07C *21/00*

U.S. Cl. 260—654 H **4 Claims**

1. In a process of chlorinating butadiene to produce principally dichlorobutenes by feeding a reactor with a mixture of butadiene vapor and chlorine vapor, the butadiene to chlorine ratio being in excess of one mole of butadiene to one mole of chlorine, recovering the dichlorobutenes from the reactor and recycling unreacted butadiene back to the reactor;

the improvement which consists essentially of feeding the reactor with a mixture of butadiene vapor and chlorine vapor in a mole ratio of from 5:1 to 50:1 butadiene to chlorine, the entering vapor mixture being maintained at a temperature of from 70° to 175° C., maintaining the temperature of the vapor mixture in the reactor at from 70° to 250° C. whereby substantially all of the chlorine is reacted, conducting the product from the reactor to the lowest tray in a multiple tray scrubber-cooler and feeding makeup liquid butadiene to one or more upper trays of the scrubber-cooler, condensing the dichlorobutenes and

separating them from unreacted butadiene while vaporizing the makeup liquid butadiene, the head temperature of the scrubber-cooler being maintained at from 45° to 80° C. by the makeup liquid butadiene and by recycling part of the scrubber-cooler bottom stream through a cooler and back to one or more upper trays of the scrubber-cooler, recycling the unreacted butadiene and the vaporized makeup butadiene from the scrubber-cooler to the reactor and recovering condensed dichlorobutenes.

4,049,730

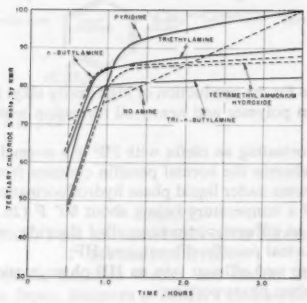
AMINE PROMOTERS FOR HYDROHALOGENATION

Jesse K. Boggs, Seabrook, Tex., assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 171,607, Aug. 13, 1971, Pat. No. 3,852,368. This application Oct. 12, 1973, Ser. No. 406,128

Int. Cl.[2] C07C *17/08*

U.S. Cl. 260—663 **12 Claims**



1. In the liquid phase hydrochlorination of a Type III olefin to produce the corresponding tertiary alkyl chloride by injecting gaseous hydrogen chloride into a liquid reaction medium containing said olefin and from about 20 to about 50 weight percent of a hydrocarbon solvent which boils in the range between about 75 and about 360° F. and is an inert liquid at the hydrochlorination temperature, the improvement which comprises adding from about 0.3 to about 15 weight percent of an amine promoter selected from the group consisting of tributylamine, triethylamine, n-butylamine, tetramethylammonium hydroxide, and pyridine to said medium, injecting said gaseous hydrogen chloride into said medium at a temperature between about 20° and about 100° F. and a pressure between about 0.5 and about 100 psig, and recovering a tertiary alkyl chloride from said reaction medium.

4,049,731

STABILIZED POLYMERIZABLE COMPOSITIONS

Alfred Joseph Restaino, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed July 14, 1975, Ser. No. 595,412

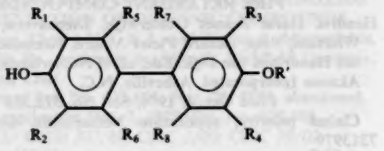
Int. Cl.[2] C10G *9/16*; C08K *5/13*

U.S. Cl. 260—666.5 **9 Claims**

1. A polymerizable composition stabilized against premature polymerization comprising

a. at least about 30 percent by weight based on the total weight of the composition of a vinyl or vinylidene monomer capable of free radical polymerization, and

b. a polymerization inhibitor having the following general formula



wherein

R' is hydrogen or an alkyl group containing from 1 to 4 carbon atoms,

R_1, R_2, R_3 and R_4 are alkyl groups containing from 1 to 5 carbon atoms, and

R_5, R_6, R_7 and R_8 are hydrogen or alkyl groups containing from 1 to 5 carbon atoms provided that only two of these may be a secondary or a tertiary alkyl group.

4,049,732

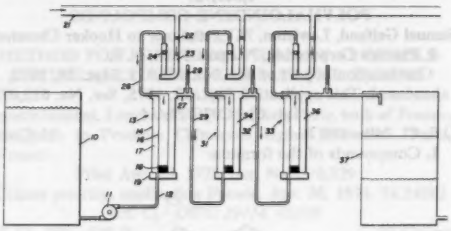
CONTINUOUS TELOMERIZATION PROCESS AND ITS LIQUID PRODUCTS

Ricardo O. Bach, and Robert C. Morrison, both of Gastonia, N.C., assignors to Lithium Corporation of America, Gastonia, N.C.

Filed Sept. 22, 1976, Ser. No. 725,640

Int. Cl.[2] C07C *15/02*

U.S. Cl. 260—668 B **25 Claims**



1. In a continuous process of producing normally liquid telomers wherein a liquid telogen is metalated with an organometal initiator and said metalated telogen is then reacted with at least one gaseous taxogen selected from the group of conjugated dienes and vinyl-substituted aromatic compounds, the steps which comprise forming a solution of said initiator and said telogen, continuously passing said solution to a first reaction zone, continuously passing a controlled stream of said gaseous taxogen through fine apertures into said first reaction zone into direct contact with said initiator solution to effect telomerization of the telogen in said first reaction zone, continuously passing the resulting intermixture containing liquid telomer into a second reaction zone while continuously passing said gaseous taxogen through fine apertures into said intermixture containing liquid telomer to produce additional quantities of telomer.

4,049,733

SYNTHESIS OF DIPHENYLMETHANE USING PHOSPHORIC-SULFURIC ACID CATALYST

Michael Martan, Skokie, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 17, 1975, Ser. No. 623,230

Int. Cl.[2] C07C *15/16*

U.S. Cl. 260—668 C **5 Claims**

1. A process for the preparation of diphenylmethane which comprises reacting dibenzyl ether with benzene at a temperature of from about 50° to about 250° C. and a pressure of from about atmospheric to about 100 atmospheres in the presence of a catalytic amount of a phosphoric acid selected from the

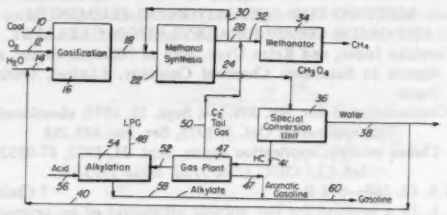
group consisting of polyphosphoric, metaphosphoric, orthophosphoric, pyrophosphoric and hypophosphoric acids, said phosphoric acid catalyst admixed with sulfuric acid.

4,049,734

CONVERSION OF COAL TO HIGH OCTANE GASOLINE

William E. Garwood, Haddonfield; Solomon M. Jacob; James C. Kuo, both of Cherry Hill, all of N.J., and John J. Wise, Media, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 8, 1975, Ser. No. 566,149
Int. Cl.[2] C07G *15/00*
U.S. Cl. 260—668 R 7 Claims



1. A process of converting coal to aromatic gasoline comprising:

reacting coal with oxygen and steam at about 1450° to 1800° F to produce a synthesis gas product comprising carbon oxides, hydrogen and methane;

catalyzing the conversion of said carbon oxides and hydrogen to a product comprising water, C_4^- gas and C_5^+ aromatic gasoline by a catalyst comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least 12 and a constraint index of 1 to 12;

contracting at least the C_2^- portion of said C_4^- gas with a methanation catalyst at about 525° to 1000° F to cionvert such to synthetic natural gas; and

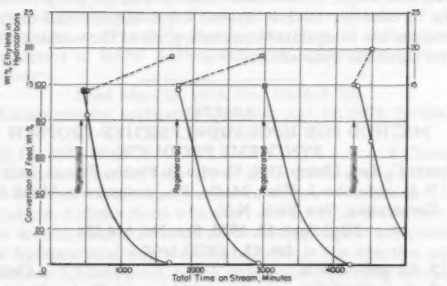
recovering synthetic natural gas, aromatic gasoline and LPG.

4,049,735

USE OF ELEMENTAL OXYGEN TO INHIBIT ELUTION OF ANTIMONY FROM AN ANTIMONY-ZSM-5 CATALYST

Nai Yuen Chen, R.D. Titusville, N.J., and William Joseph Reagen, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 9, 1976, Ser. No. 749,150
Int. Cl.[2] C07C *1/20*
U.S. Cl. 260—668 R 12 Claims



1. An improved process for producing hydrocarbons, which comprises:

passing to a catalytic conversion zone, under conversion conditions, a feed comprising oxygenated compounds and a co-feed of elemental oxygen, said oxygenated compounds consisting essentially of one or more lower monohydric alcohol having up to four carbon atoms, the ethers derived therefrom, or mixtures of said alcohols and ethers, said co-feed being passed in an amount equal to from 0.1 mol percent to 10 mol percent of said feed, and said catalytic conversion zone containing a catalyst comprising an intimate admixture of an oxide of antimony and a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index from 1 to 12, said antimony oxide constituting at least 1% by weight of said admixture, and recovering from said catalytic conversion zone a mixture comprising light olefins, monocyclic aromatic hydrocarbons and steam.

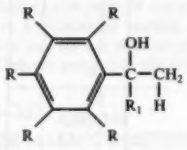
4,049,736

DEHYDRATION OF α-METHYLBENZYL ALCOHOLS TO FORM MONOVINYLIDENE AROMATIC MONOMERS

Junior J. Lamson, Bay City; Richard H. Hall, Midland; Edward Stroiwas, Merrill, and Larry D. Yats, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 39,889, May 22, 1970, abandoned. This application Aug. 4, 1975, Ser. No. 601,946
Int. Cl.[2] C07C *15/00, 15/10*
U.S. Cl. 260—669 QZ 12 Claims

1. A process for preparing an ar-(t-alkyl)styrene by dehydrating an α-alkylbenzyl alcohol represented by the general formula



wherein each R is independently hydrogen, alkyl having from 1 to 12 carbon atoms or halogen provided that an R group is t-alkyl and R_1 is hydrogen or alkyl having 1 to 4 carbon atoms which method comprises a dehydration step of contacting the α-alkylbenzyl alcohol in vapor phase with a silica gel dehydration catalyst consisting essentially of silica gel in the presence of from about 0.03 to about 25 parts by weight of added water per part by weight of alcohol, said dehydration step being carried out at temperatures above 260° up to about 510° C, and subsequent simple distillation step of distilling the dehydration product to obtain the ar-(t-alkyl)styrene in purity greater than about 99 mole percent and containing less than 0.02 mole percent of diolefinic impurity.

4,049,737

PROPYLATION OF TOLUENE

Francis G. Dwyer, West Chester, Pa., and Donald J. Klocke, Somerdale, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,731
Int. Cl.[2] C07C *3/52*
U.S. Cl. 260—671 P 4 Claims

1. A process for the propylation of toluene with selective production of cymene consisting essentially of vapor phase reaction of toluene and propylene at a temperature between about 400° F. and about 500° F. and a weight hourly space velocity between about 0.5 and about 100 in the presence of a catalyst comprising ZSM-5 crystalline aluminosilicate zeolite, said zeolite having a silica to alumina ratio of at least about 12.

4,049,738

SELECTIVE PRODUCTION OF PARA-XYLENE

Lewis B. Young, Kendall Park, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed July 12, 1976, Ser. No. 704,194
Int. Cl.[2] C07C *3/52, 15/08;* C01B *33/28*
U.S. Cl. 260—671 M 9 Claims

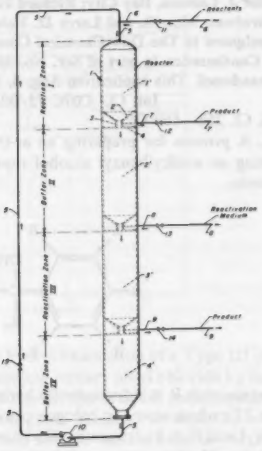
1. A process for the selective production of para xylene which comprises reacting toluene with a methylating agent of a temperature between about 300° C. and about 750° C. in the presence of a catalyst comprising the crystalline aluminosilicate zeolite ZSM-23.

4,049,739

SIMULATED MOVING BED ALKYLATION PROCESS

Robert F. Zabransky, Oak Brook, and Robert F. Anderson, La Grange, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 587,470, June 16, 1975, Pat. No. 4,008,291.
This application Aug. 27, 1976, Ser. No. 718,295
Int. Cl.[2] C07C *3/52*
U.S. Cl. 260—671 R 7 Claims



1. A continuous fixed bed catalytic alkylation reaction and catalyst reactivation process comprising the steps of:

a. providing a crystalline aluminosilicate zeolite catalyst composited with a Group VIII metal hydrogenation agent in a fixed bed containing four zones and having a fluid flow connecting path between said zones to interconnect said zones;

b. arranging said zones in a series and providing fluid flow connecting means between the last zone and the first zone of the series to provide a directional circular flow path through said zones;

c. providing a point between each two successive zones for introducing an inlet stream or withdrawning a product stream;

d. introducing a reactivation stream including alkylatable aromatic hydrocarbon and hydrogen at a first point located between two successive zones (zone II and zone III) to effect catalyst reactivation and to provide alkylatable aromatic hydrocarbon as a continuous component throughout said fixed bed of catalyst;

e. simultaneously withdrawing a first product stream from a second point located between said zone III and the next successive zone in the direction of flow (zone IV);

f. simultaneously introducing reactants consisting essentially of at least one alkylatable aromatic hydrocarbon and at least one olefin into said fixed bed of catalyst at a third point located between said zone IV and the next successive zone in the direction of flow (zone I) and reacting said reactants at a temperature of from about 100° F. to about 400° F. to effect an alkylation reaction, a result of which is deactivation of said catalyst, said alkylation and catalyst reactivation being the principal reactions of the process;

g. simultaneously withdrawing a second product stream from a fourth point located between said zone I and the next successive zone in the direction of flow (zone II); and

h. periodically advancing downstream the points of charging said reactants and said reactivation stream, and the points of withdrawal of said product streams to the next successive point for introducing an inlet stream or withdrawing an outlet stream.

4,049,740

METHOD FOR ACTIVATION OF ALUMINUM CHLORIDE COMPLEX ALKYLATION CATALYST

Yasuhiko Inoue, and Keizo Uyeo, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 399,744, Sept. 21, 1973, abandoned.
This application Oct. 3, 1975, Ser. No. 619,253
Claims priority, application Japan, Sept. 21, 1972, 47-95522
Int. Cl.[2] C07C *3/56, 3/52;* B01J *27/32*
U.S. Cl. 260—671 R 7 Claims

1. In a method for the nuclear alkylation of an aromatic hydrocarbon compound in which said aromatic hydrocarbon compound is reacted with an alkyl halide in the presence of a catalytic amount of an aluminum chloride-aromatic hydrocarbon compound complex under reaction conditions which cause nuclear substitution in said aromatic hydrocarbon compound by an alkyl radical to be effected, the improvement which comprises:

A. Separating the aluminum chloride-aromatic hydrocarbon compound complex from the reaction mixture resulting from said nuclear alkylation of an aromatic hydrocarbon compound, and

B. Regenerating said aluminum chloride-aromatic hydrocarbon compound complex by washing at least part of it with a straight chain paraffinic hydrocarbon of 5–24 carbon atoms which is liquid under the washing conditions and in an amount of at least 0.1 part by volume of said paraffinic hydrocarbon per 1 part by volume of aluminum chloride-aromatic hydrocarbon complex to permit the subsequent formation of two separate layers, the lower layer consisting solely of the regenerated aluminum chloride-aromatic hydrocarbon compound complex, said washing being conducted in a temperature range in which isomerization of said paraffinic hydrocarbon will not be effected, separating said lower layer of regenerated aluminum chloride-aromatic hydrocarbon complex and recycling said regenerated catalyst to said alkylation reaction.

5. The method of claim 1, wherein the separated aluminum chloride-aromatic hydrocarbon compound complex is washed with an aromatic hydrocarbon selected from the group consisting of benzene, toluene, xylene, ethyl benzene and diethyl benzene and is separated therefrom prior to the washing with said paraffinic hydrocarbon.

4,049,741

METHOD FOR UPGRADING FISCHER-TROPSCH SYNTHESIS PRODUCTS

James C. Kuo, Cherry Hill; Charles D. Prater, Pitman, both of N.J., and John J. Wise, Media, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,584
Int. Cl.[2] C07C *1/04*
U.S. Cl. 260—676 R 6 Claims

1. A method for upgrading products of Fischer-Tropsch synthesis which comprises,

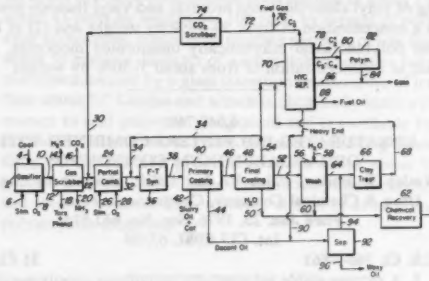
separating the product effluent of Fischer-Tropsch after cooling to recover a synthetic water phase comprising oxygenates, a normally liquid hydrocarbon light oil phase boiling below about 560° F comprising oxygenates and a

normally gaseous phase rich in C_3 hydrocarbons in combination with lower boiling gaseous materials,

passing the normally liquid hydrocarbon light oil phase boiling below about 560° F without further water washing in contact with a selective crystalline aluminosilicate zeolite that has a pore diameter greater than about 5 Angstroms; a silica-to-alumina ratio of at least 12; a constraint index within the range of 1 to 12; under conversion conditions selected to increase the octane rating of a gasoline product separated therefrom in combination with gaseous components suitable for alkylation,

passing the products obtained from said normally liquid hydrocarbon light oil conversion operation to product separation,

passing the total synthesis gaseous phase rich in C_3 hydrocarbons and comprising a mixture of carbon monoxide, methane, paraffins, olefins and oxygenates in contact with a selective crystalline aluminosilicate zeolite that has a pore diameter greater than about 5 Angstrom units; a silica-to-alumina ratio of at least 12; and a constraint index within the range of 1 to 12 under conversion conditions selected for upgrading hydrocarbon components of said gaseous phase to gasoline boiling compounds and gaseous hydrocarbons suitable for alkylation,



passing the products obtained from said gaseous phase conversion operation to product separation,

separating the products of said catalytic conversion operations to recover gasoline boiling product of improved octane rating, a light fuel oil product higher boiling than said gasoline fraction, a C_3–C_4 net fraction suitable for alkylation and a stream comprising C_2 and lower boiling hydrocarbons.

4,049,742

RECOVERY OF 1,3-BUTADIENE FROM A C_4-HYDROCARBON MIXTURE

Hans-Martin Weitz, Bad Durkheim; Ulrich Wagner, Limburgerhof; Klaus Voikamer, Frankenthal; Eckart Schubert, Ludwigshafen, and Friedhelm Bandermann, Hern, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 23, 1976, Ser. No. 669,710
Claims priority, application Germany, Apr. 15, 1975, 2516362
Int. Cl.² C07C *7/08*
U.S. Cl. 260—681.5 R **9 Claims**

1. A process for the recovery of 1,3-butadiene, using a selective solvent, from a C_4-hydrocarbon mixture containing 1,3-butadiene, hydrocarbons which are more soluble in the selective solvent than 1,3-butadiene, including higher acetylenes and hydrocarbons which are less soluble in the selective solvent than 1,3-butadiene, which comprises: separating the C_4-hydrocarbon mixture in a first extractive distillation zone into a distillate containing the less soluble hydrocarbons and an extract of 1,3-butadiene, the more soluble hydrocarbons and the selective solvent; removing the selective solvent from the extract to obtain a mixture of 1,3-butadiene and the more soluble hydrocarbons; passing the mixture of 1,3-butadiene and the more soluble hydrocarbons through a second extractive distillation zone to obtain 1,3-butadiene as a distillate and an extract containing the more soluble hydrocarbons including the higher acetylenes and a residue of 1,3-butadiene and the selective solvent; recovering from the extract a stream containing the more soluble hydrocarbons including the higher acetylenes and 1,3-butadiene having a content of acetylenes of from 10 to 60% by weight; subjecting the acetylenes-containing stream to selective catalytic hydrogenation in the presence of hydrogen and a hydrogenation catalyst to selectively hydrogenate the acetylenes; and adding the hydrocarbon stream obtained after hydrogenation to the starting C_4-hydrocarbon mixture.

4,049,743

SELECTIVE OXIDATION OF ACETYLENES

Lewis E. Drehman, and Floyd Farha, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 7, 1976, Ser. No. 703,164
Int. Cl.² C07C *11/02*
U.S. Cl. 260—681.5 R **7 Claims**

1. A process for the selective removal of acetylenic contaminants or impurities present in hydrocarbon streams which comprises contacting oxygen and a gaseous hydrocarbon stream comprising lower olefins and diolefins contaminated with relatively minor amounts of acetylenic compounds with a catalyst consisting essentially of zinc aluminate promoted with copper, manganese, and a rare earth metal in which each of the promoter metals is present in an amount ranging from about 0.1 to about 20 weight percent based on the weight of zinc aluminate plus metal promoters under oxidation conditions including a temperature and a mole ratio of oxygen to hydrocarbon sufficient to remove a substantial portion of said acetylenic compounds present in said stream without destroying desirable unsaturated hydrocarbons present in the stream treated.

4,049,744

PROCESS FOR MAKING POWDER COATINGS

John Edward Masters, Louisville, Ky., assignor to Celanese Polymer Specialties Company, Louisville, Ky.

Filed Sept. 29, 1975, Ser. No. 617,480
Int. Cl.² C08G *59/18*
U.S. Cl. 260—837 R **17 Claims**

1. A process for preparing finely divided particles of a complex polyhydroxy polyether resin having a melting point of at least 80° C. which comprises

a. mixing at a temperature of at least 60° C. said resin with water having dissolved or colloidally dispersed therein an inorganic or organic base salt of a polymeric polycarboxylic acid, said acid having an unsalted acid value of at least 50, wherein said polymeric salt is present at about 1 to 25 weight percent based on the weight of said resin;

b. agitating the mixture to form a dispersion having a particle size of about 1 to about 50 microns;

c. reducing the solids content of the dispersion with water;

d. cooling the dispersion below the melting point of the resin;

e. acidifying the dispersion to a pH of about 1 to about 7; and

f. recovering the dispersed particles.

4,049,745

HIGHLY REACTIVE SULPHUR-CONTAINING COATING AGENTS HARDENING UNDER UV-LIGHT

Karl Ernst Schuster, Kerken; Hans Jurgen Rosenkranz, Krefeld, and Hans Rudolph, Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed July 22, 1976, Ser. No. 707,871
Claims priority, application Germany, July 24, 1975, 2533125
Int. Cl.² C08L *63/00*
U.S. Cl. 260—837 R **2 Claims**

1. A process for the production of a reaction product of a

polyepoxide and an α,β-monoolefinically unsaturated carboxylic acid, wherein at least 60% of the epoxide groups of a polyepoxide with more than one 1,2-epoxide group per molecule are reacted

a. with 0.01 to 0.6 SH-equivalents, based on one epoxide equivalent, of hydrogen sulphide, an aliphatic cycloaliphatic aromatic or araliphatic dithiol or polythiol or with a mixture thereof, and subsequently

b. with 0.99 to 0.4 carboxyl equivalents, based on one epoxide equivalent, of acrylic or methacrylic acid or of a mixture thereof.

4,049,746

INTERMEDIATE COATING COMPOSITIONS AND LONG RUNNING PLANOGRAPHIC PLATES PREPARED THEREWITH

Thaddeus M. Muzyczko, Melrose Park; Ronald A. Frederiksen, Schaumburg, and David L. York, Elgin, all of Ill., assignors to The Richardson Company, Des Plaines, Ill.

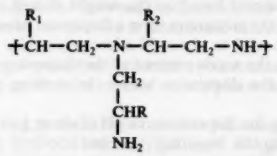
Continuation of Ser. No. 455,635, March 28, 1974, abandoned, which is a continuation of Ser. No. 247,205, April 24, 1972, abandoned, which is a division of Ser. No. 97,394, Dec. 4, 1970, Pat. No. 3,690,880. This application Aug. 22, 1975, Ser. No. 606,990

Int. Cl.[2] C08L *61/24*

U.S. Cl. 260—851 **8 Claims**

1. A subbase coating composition for photolithographic plates comprising a salt formed from the reaction product of a water soluble polyacrylic resin containing carboxy groupings and a polyalkylenimine-urea-aldehyde resin, said polyacrylic resin being selected from the group consisting of polymers of acrylamide, hydrolyzed acrylamide, acrylic acids and salts thereof, and having a molecular weight range of from 10,000 to 200,000, wherein said polyalkylenimine-urea-aldehyde resin is a product made according to a process which comprises the steps of:

a. heating and reacting a polyalkylenimine resin having the following general formula:



wherein R_1 and R_2 are alike or different and are selected from the group consisting of hydrogen, lower alkyl, water and urea to form from about 10 to about 30 percent of a polyurea reaction product, while water and ammonia are removed;

b. adding thereto and reacting additional urea;

c. methylolating the reaction mixture with an aldehyde to form said polyalkylenimine-urea-aldehyde resin;

wherein said salt is characterized by the reaction of carboxy groups of said polyacrylic resin with the tertiary amino groups of the polyalkylenimine resin.

4,049,747

CROSSLINKED VINYL HALIDE POLYMERS AS FLAME RETARDANT ADDITIVES FOR THERMOPLASTICS

Jung Il Jin, Irvington, and Paul Kraft, Spring Valley, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 512,773, Oct. 7, 1974, Pat. No. 4,022,849, which is a division of Ser. No. 395,684, Sept. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 108,632, Jan. 21, 1971, Pat. No. 3,780,141. This application Nov. 15, 1976, Ser. No. 741,903

Int. Cl.[2] C08L *75/00*

U.S. Cl. 260—859 PV **13 Claims**

1. A fire retardant polyblend comprising an intimate admixture of at least one polyurethane resin; and an effective flame retarding concentration of at least one crosslinked copolymer of: (1) at least one vinyl halide selected from the group consisting of vinyl chloride, vinyl bromide and vinyl fluoride present in a concentration of from 50–99% by weight and (2) at least one polyfunctional ethylenically unsaturated monomer, present in a concentration of from about 1–50% by weight.

4,049,748

UNSATURATED POLYESTERS COMBINED WITH ORGANOALUMINUM COMPOUNDS

Wesley T. Bailey, Palos Verdes, Calif., assignor to Chattem Drug & Chemical Company, Chattanooga, Tenn.

Filed Jan. 23, 1976, Ser. No. 651,814

Int. Cl.[2] C08L *67/06*

U.S. Cl. 260—861 **31 Claims**

1. A sotrage stable substantially anhydrous copolymerizable non-Newtonian liquid unsaturated polyester resin composition, said composition being the reaction product of the following components on an initial 100 weight percent total composition basis:

A. from about 20 to 90 weight percent of an unsaturated polyester resin having a molecular weight ranging from about 1000 to 30000 and comprised of a condensate of at least one polyol with at least one polycarboxylated compound,

B. from about 0.1 to 20.0 weight percent of at least one organoaluminum compound the exact amount of said organ aluminum compound present in any given said composition being such that said composition remains in a liquid condition, and

c. from about 10 to 80 weight percent of a liquid comprising at least one vinyl monomer having a molecular weight ranging from about 100 to 250 and having a boiling point greater than about 100° C.,

said components (A) and (B) being substantially completely dissolved in said component (C), said component (B) first being dissolved in a portion of said component (C) before being blended with a solution of said component (A) in another portion of said component (C), said organoaluminum compound being characterized by:

a. containing at least one aluminum atom per molecule,

b. containing at least one oxygen atom per molecule,

c. containing at least four carbon atoms per molecule at least two of which are bonded directly to one another by one or two bonds in a carbon-to-carbon chain,

d. each said aluminum atom having three bonds and being bonded by at least one of such bonds to one of the carbon atoms in said chain through one of said oxygen atoms intermediately, said carbon atom so bonded having additionally no oxygen atoms double bonded thereto,

e. being soluble in styrene to a weight percentage at least about equal to the weight percentage of such organoaluminum compound is employed in a given such resin composition,

f. having a formula weight of from about 130 to 1000, and

g. causing a cloudy dispersion of alumina particles to form when a 10 weight percent solution of such organoaluminum compound in anhydrous benzene is admixed with

benzene saturated with distilled water and the resulting mixture is heated for four hours at 60° C.

4,049,749

PIGMENTABLE LOW-PROFILE POLYESTER MOLDING COMPOSITIONS

Donald H. Thorpe, Williamsville, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Dec. 2, 1975, Ser. No. 636,872
Int. Cl.² C08L *33/12, 67/06*
U.S. Cl. 260—862 **18 Claims**

1. A molding composition comprising

A. a polymerizable unsaturated polyester; and

B. an additive component, present in an amount of about 5 to about 45 parts by weight per 100 parts by weight of polyester component, comprising discrete particles of less than about 50 microns diameter of a cross-linked acrylate polymer characterized by a glass transition temperature of less than about 75° Celsius and which is chemically inert with respect to said polyester component and is swellable but insoluble therein, said acrylate polymer consisting essentially of the reaction product of about 75 to about 95 percent by weight of at least one monoacrylate monomer and about 5 to about 25 percent by weight of at least one polyacrylate monomer.

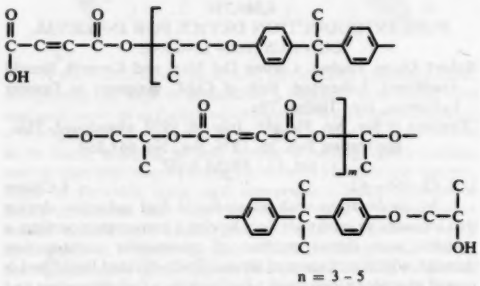
4,049,750

ONE COMPONENT SHELF STABLE LOW SHRINKAGE STRUCTURAL ADHESIVE SYSTEMS

Walter Brenner, 974 Columbus Drive, Teaneck, N.J. 07666

Filed July 29, 1975, Ser. No. 594,459
Int. Cl.² C08L *67/06*
U.S. Cl. 260—864 **13 Claims**

1. A liquid one component structural adhesive composition having controlled viscosity which is stable at ambient temperatures for an extended time period in the presence of oxygen but cures at ambient temperatures in the absence of oxygen or at elevated temperatures in the presence or absence of oxygen to the solid state with low shrinkage said composition comprising a polyester based on the reaction of bisphenol A with fumaric acid having typically the chemical formula configuration



n = 3 - 5

said polymerizable polyester amounting to between 70 - 98% of the adhesive composition, a chemically compatible ethylenically unsaturated organic liquid monomer, a catalyst/inhibitor system containing a peroxide type initiator, accelerators and inhibitors as well as, optionally, thixotropic agents, thickeners, dyes, pigments and other additives which will impart desirable use properties.

4,049,751

EXTRACTION RESISTANT POLYOLEFIN STABILIZERS

Frank Scardiglia, Woodcliff Lake, N.J., and Kornel Dezso Kiss, Yonkers, N.Y., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Apr. 26, 1976, Ser. No. 680,029
Int. Cl.² C08K *5/10, 5/13;* **C08L** *23/12;* **C08F** *255/02*
U.S. Cl. 260—876 R **14 Claims**

1. A composition of matter which comprises a complex of a hindered phenolic antioxidant and a high molecular weight polymeric nitrogenous complexing agent having complexing group derived from N-vinyl-2-pyrrolidone.

4,049,752

POLYMERIC COMPOSITIONS OF STYRENE AND AMORPHOUS POLYOLEFINS USEFUL IN PREPARING HOT MELT ADHESIVES

Kenneth H. Albers, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,327
Int. Cl.² C08F *255/00, 255/02, 255/04, 255/08*
U.S. Cl. 260—878 R **9 Claims**

1. A process for preparing polymeric compositions having a styrene content of about 1 to about 90 percent by weight of said compositions which comprises polymerizing styrene in the presence of an amorphous polyolefin having a melt viscosity at 190° C. of from about 100 to about 500,000 centipoise with a peroxide catalyst at a temperature in the range of about 160° to about 300° C.

8. A white, nonpigmented polymeric polyolefin composition comprising an amorphous polyolefin which contains about 1 to 90 percent by weight polymerized styrene, has a melt viscosity at 190° C. of 100 to 500,000 centipoise prepared by polymerizing styrene in the presence of said amorphous polyolefin with a peroxide catalyst at a temperature of about 210° to about 300° C.

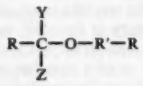
4,049,753

COUPLING OF ALKALI METAL-TERMINATED POLYMERS

George A. Moczygemba, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

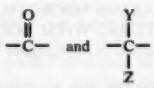
Filed Apr. 19, 1976, Ser. No. 678,096
Int. Cl.² C08F *8/00, 8/02, 8/06, 8/10*
U.S. Cl. 260—880 B **6 Claims**

1. A polymer having the structure



(I)

wherein the radicals R, which can be the same or different, are hydrocarbyl radicals with 1 to 7 carbon atoms, R′ is a divalent radical selected from the group consisting of



wherein Y is selected from the group of radicals consisting of —OH and —Z, and wherein Z is a homopolymer or copolymer chain of one or more conjugated alkadienes of 4 to 12 carbon atoms per molecule or a copolymer chain of at least one alkadiene of 4 to 12 carbon atoms and at least one monovinyl-substituted arene radical of 8 to 18 carbon atoms per molecule, the vinyl radical being attached to a carbon atom of the arene ring,

with the further provision that at least 160 polymer chains Z are present in 100 molecules of formula (I).

4,049,754

TRIBROMONEOPENTYL PHOSPHORUS REACTIVE FLAME RETARDANTS

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sept. 23, 1976, Ser. No. 726,077
Int. Cl.² C07F *9/09, 9/11, 9/14, 9/40*
U.S. Cl. 260—952 **11 Claims**

1. Compounds of the formula

$$[(BrCH_2)_3CCH_2O]_2P(O)R$$

wherein R is a functional group selected from the group consisting of $-CH{=}CH_2$, $-CH_2X$, $-OR'OC(O)CH{=}CH_2$, $-OR'OC(O)C(CH_3){=}CH_2$, $-O(R'O)_nH$, $-OH$, Cl and $-NR''R'''$ where R' is a C_1–C_4 alkylene or haloalkylene group, R'' and R''' are the same or different and are selected from the group consisting of hydrogen, lower alkyl, phenyl, hydroxy lower alkyl, and allyl groups, X is selected from the group consisting of chlorine and bromine and *n* is an integer between 1 and 20.

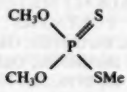
4,049,755

PROCESS FOR PREPARING O,O-DIMETHYLDITHIOPHOSPHORIC ACID AND ALKALINE SALTS THEREOF

Sergio Bianchi, Bresso (Milan); Mario Bornengo, Mestre (Venezia), and Alessandro Frangioni, Mogliano Veneto (Treviso), all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jan. 10, 1975, Ser. No. 539,966
Claims priority, application Italy, Jan. 11, 1974, 19333/74
Int. Cl.² C07F *9/17*
U.S. Cl. 260—987 **4 Claims**

1. Process for the continuous production of a stable alkaline solution of O,O-dimethyldithiophosphoric acid of the formula



in which Me is Na, K or NH_4, in high yield and of a high degree of purity, and while avoiding explosions, said process consisting in reacting highly reactive phosphorus pentasulphide with methanol in an excess of 30% to 70% by weight of toluene with regard to the reacting mass, at a pressure of from 1 to 5 atm., at a temperature of from 60° to 75° C, in the presence of from about 0.01 to about 0.5% by weight, on the methanol weight, of pyridine or of a pyridine base, for an average reaction time of 30 to 60 minutes, and thereafter treating the toluene solution of O,O-dimethyldithiophosphoric acid thus obtained with an aqueous solution of an alkaline hydroxide.

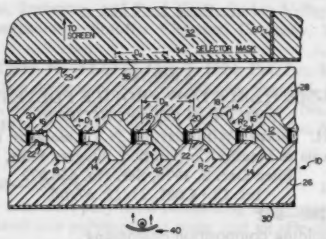
4,049,756

METHOD OF MAKING MICROFICHE LAMINATE HAVING APERTURES WITH DOUBLET LENSES

George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

Division of Ser. No. 539,458, Jan. 8, 1975. This application Oct. 16, 1975, Ser. No. 622,827
Int. Cl.² B29D *3/00, 9/10, 11/00;* **B29F** *5/00*
U.S. Cl. 264—1 **2 Claims**

1. In a method of forming a microfiche laminate having an apertured opaque sheet with facing plano-convex lenses forming a doublet lens in at least one through aperture of said sheet, the steps comprising: forming opposite concavities on opposite sides of an apertured opaque sheet, two of said opposite concavities being contiguous to at least one aperture; disposing transparent thermoplastic sheet material on said opposite sides of said apertured sheet; applying heat and pressure to said



thermoplastic material on said opposite sides causing said material to flow into said concavities and only partially into said apertures to form said facing plano-convex lenses.

4,049,757

PROCESS FOR THE PRODUCTION OF SHAPED BODIES FROM POLYOLEFINS

Gernot Kammel, Erlangen, and Rudolf Wiedenmann, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 28, 1975, Ser. No. 572,516
Claims priority, application Germany, Apr. 29, 1974, 2420784
Int. Cl.² B01J *1/10*
U.S. Cl. 264—22 **8 Claims**

1. A process for the production of shaped bodies and semi-finished products from olefin homopolymers and copolymers crosslinkable by high energy radiation in the presence of a polyfunctional ethylenically unsaturated monomer capable of reducing the radiation dosage for cross-linking said olefin polymer comprising:

a. forming a mixture of said olefin polymer, monomer and from 0.05 to 0.5% based on the weight of the said olefin polymer of at least one heat decomposable organic polymer active radical forming agent;

b. shaping said mixture and heating said mixture during or after shaping at a temperature above the decomposition temperature of said radical forming agent until said agent decomposes and a shaped crosslinkable body is formed whereby oligomerization of said monomer occurs so as to substantially prevent migration of said monomer to the surface of said shaped body; and

c. crosslinking said shaped body with high energy radiation.

4,049,758

FUEL INTRODUCTION DEVICE FOR INTERNAL COMBUSTION ENGINE

Robert Dixon Englert, Corona Del Mar, and Kenneth Ronald Armstrong, Lakewood, both of Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 384,166, July 30, 1973, abandoned. This application Feb. 26, 1976, Ser. No. 661,557
Int. Cl.² F02M *9/02*
U.S. Cl. 261—62 **4 Claims**

1. In combination with an air-liquid fuel induction device that includes an intake air duct having a converging portion, a variable area throat portion of rectangular cross-section through which a mixture of air and finely divided liquid fuel is passed at sonic velocity and a fuel supply, a fuel dispensing and air flow shaping device including in combination:

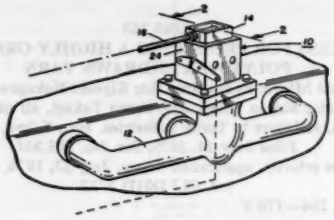
a. an elongated distributor body positioned upstream of the throat and extending within said air duct in a direction parallel to the longer axis of the rectangular throat, said distributor body being positioned at an intermediate location within said air duct to divide the flow of air into converging streams;

b. means forming a plurality of displaced fuel openings in

said distributor body extending longitudinally therealong, said openings being located within the converging portion of the intake air duct and adapted to discharge fuel therefrom in a plurality of coherent liquid streams for atomization by the converging air streams;

c. means forming an internal passage within said distributor body and connected to said fuel supply communicating with the openings for the passage of liquid fuel;

d. fuel joinder prevention means attached to said distributor body positioned downstream of said openings and spaced



therefrom, said fuel joinder prevention means being spaced along substantially the entire length of said body transversely of the direction of air flow and being effective to minimize joinder between streams of liquid fuel discharged from said openings, and

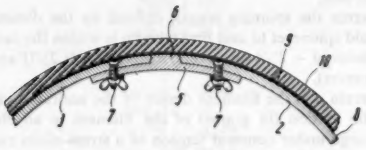
e. the distributor body having an exterior surface position extending between the fuel openings and the joinder prevention means providing an uninterrupted surface over which fuel flows under conditions of relatively low air velocity moving past said openings.

4,049,759

METHOD AND ARRANGEMENT FOR USE IN LINING ARTICLES, PARTICULARLY MELTING OVENS

Rudolf Florian, Blomberg, Germany, assignor to Dörentruper Sand- und Thonwerke GmbH, Dorentrup, Germany

Filed Mar. 19, 1975, Ser. No. 559,865
Claims priority, application Germany, Mar. 23, 1974, 2414060
Int. Cl.² F27D *1/16*
U.S. Cl. 264—30 **12 Claims**



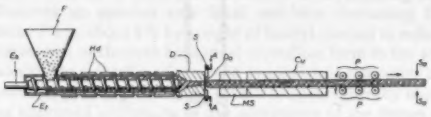
1. A method of lining an article, particularly a melting oven, comprising the steps of assembling a plurality of sections with one another so as to form a mold member with a surface having a configuration corresponding to a face of the article which is to be lined; applying to said surface a parting agent; coating said surface above said parting agent with a hardenable composition in flowable state, said composition being hardenable under conditions such that the configuration of said member retains substantially unchanged, and said composition being hardenable to a hardened state which is maintainable during the rigidification of a lining surface for said article; hardening said composition to said hardened state under said conditions; arranging the coated member and said article relative to one another so that the hardened composition is directed towards said face and is spaced therefrom; admitting said lining substance into the space defined intermediate said face and said hardened composition; disassembling said sections from one another; removing said sections from said hardened composition intact and in such a manner that said hardened composition remains as the sole support for said lining substance at the interior of the latter; and subsequently rigidifying said lining substance located in said space intermediate said face and said hardened composition while said hardened composition supports said lining substance at the interior of the same.

4,049,760

METHOD OF MANUFACTURE OF FOAMED THERMO-PLASTIC EXTRUDED SHAPES

Guy Lozach, Chantilly, France, assignor to Societe Chimique des Charbonnages, Courbevoie, France

Continuation-in-part of Ser. No. 450,838, March 13, 1974, abandoned. This application Mar. 31, 1976, Ser. No. 672,490
Claims priority, application France, Mar. 16, 1973, 73.09609
Int. Cl.² B29D *27/00*
U.S. Cl. 264—51 **10 Claims**



1. A method for the extrusion-manufacturing of a diversity of structural foamed thermoplastic material shaped sections of indefinite length and having a density of 0.4 to 0.9 with respect to the corresponding solid thermoplastic material, said method comprising:

extruding a foamable thermoplastic material from an extruder through a die orifice with an initial shape section the material beginning to expand at the outlet of said die;

modifying the shape-section of the expanding extrudate by partially slowing-down or stopping the expansion in preselected zones of said extrudate immediately at the outlet of said die orifice by differently cooling said zones with a plurality of jets of cooling fluid under pressure and having a temperature lower than the softening temperature of the thermoplastic material, said jets having a peripheral distribution, constituting a fluid shaping device, while permitting the expansion to continue in the non-cooled zones, whereby an extrudate having a shape-section different from that of said initial die shape is formed,

and finally fixing the resulting shape by cooling.

4,049,761

PROCESS FOR THE MANUFACTURE OF ORIENTED HOLLOW ARTICLES MADE OF THERMOPLASTIC MATERIAL

Michel Lorgé, Brussels, and Roger Houba, Gembloux, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Mar. 11, 1975, Ser. No. 557,376
Claims priority, application France, Mar. 15, 1974, 74.09380
Int. Cl.² B29C *17/07, 17/12*
U.S. Cl. 264—89 **4 Claims**

1. In a process for the manufacture of oriented hollow articles made of thermoplastic material by the steps of:

extruding a continuous hot tubular parison of thermoplastic material;

pre-blowing such parison in a pre-blowing mold to produce preforms having a cylindrical body with a diameter not more than 20% greater than that of the parison;

thermally conditioning the resulting preforms at a temperature sufficient to cause orientation of the thermoplastic material when it is being stretched; and

effecting a final blow-molding of the thermally conditioned preforms, the improvement wherein said step of pre-blowing is carried out by introducing the parison between two half-molds defining a cavity which has the shape of a hemisphere at the location of the base of the preform, each half-mold having, at such location, the shape of a quarter sphere of diameter equal to that of the preform, and hold-

ing the parison tightly between the half-molds in a manner such that the parison presents a portion located outside of the mold cavity adjacent the preform base, and projecting out of the mold to constitute a base flash joined to the resulting preform along a semicircular line, and wherein said process further comprises removing the base flash

from the preform, while the preform is still in the pre-blowing mold, by moving an elongated blade having a semicircular cross section, and a diameter which corresponds to that of the wall of the base of the cavity of the pre-blowing mold, with a reciprocating movement perpendicular to the plane of the base flash.

4,049,762

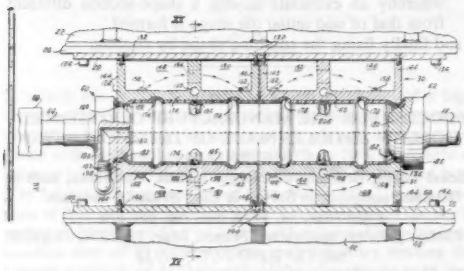
METHOD OF FORMING A PIPE COUPLING

Paul D. Martino, and Norris H. Barbre, both of Weatherford, Tex., assignors to Harsco Corporation, Camp Hill, Pa.

Continuation of Ser. No. 385,232, Aug. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 164,519, July 21, 1971, abandoned. This application Sept. 15, 1975, Ser. No. 613,288

Int. Cl.[2] B29C *17/07*; B29D *23/03*; B29F *5/00*

U.S. Cl. 264—94 **7 Claims**



1. A method of forming a thermoplastic pipe coupling comprising the steps of: heating a prefabricated thermoplastic tubular member to a soft pliable state; positioning the pliable tubular member in a mold cavity having walls maintained at a temperature to quickly harden a surface of the tubular member moved into contact therewith, the tubular member being positioned such that opposite ends of the tubular member extend beyond ends of the mod cavity; engaging only outer surfaces of the tubular member adjacent ends of the tubular member with mold portions to space walls of the tubular member from a major portion of the surface of walls of the mold cavity; moving seal members into engagement with opposite ends of the tubular member such that force is exerted on surface inside the ends of the tubular member to deform outer surfaces of the tubular member into sealing engagement with surfaces adjacent opposite ends of the mold cavity; urging the seal members into sealing engagement with inner surfaces of the tubular member; delivering pressurized fluid to a pressure actuated cylinder connected to the seal members to maintain constant pressure on said seal members to urge the seal members inwardly and to maintain a constant seal with the ends of the tubular members to compensate for the tendency of the wall of the tubular member to contract in length and thickness due to expansion of the diameter of the tubular member and cooling of the wall of the tubular member; and injecting pressurized fluid into the tubular member to urge walls of said tubular member into conformity with surfaces of the mold cavity.

4,049,763

PROCESS FOR PRODUCING A HIGHLY ORIENTED POLYESTER UNDRAWN YARN

Masatoshi Mineo; Ken-ichiro Oka; Kiyoshi Nakagawa; Hiyoshi Matsuda; Shigeo Ohno, and Yasuo Takagi, all of Mishima, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed July 14, 1975, Ser. No. 595,344

Claims priority, application Japan, July 23, 1974, 49-83777

Int. Cl.[2] D01D *5/12*

U.S. Cl. 264—176 F **3 Claims**

1. In a process for producing a highly oriented polyester undrawn yarn, in which said yarn is spun from a spinneret to a first take-up, the steps which comprise:

melt-spinning a polyester from a spinneret,

solidifying the melt-spun yarn and taking up the solidified yarn at a take-up velocity from about 2,500 to 4,500 m/min,

wherein the spinning length defined by the distance from said spinneret to said first take-up is within the range from about $(d + 2)/4$ (in meters) to about $(A/1.2)/(Faero/x)$ (in meters),

wherein d is the filament denier of the undrawn yarn, A is the tension (in grams) of the filament in an elongation range under constant tension of a stress-strain curve, $Faero/x$ is the rate of increase of the yarn tension per meter following the yarn solidification point by an air resistance which is equal to $0.229 \times 10^{-4} \cdot D^{0.39} \cdot V^{1.39}$, wherein D is the solidified filament diameter (in cm) and V is the velocity of the solidified filament (in cm/sec),

wherein the filament denier of the undrawn yarn is within the range from about 2 to 6.

4,049,764

METHOD OF FORMING HIGHLY ABSORBENT FILAMENTS AND WEBS HAVING IMPROVED SOFTNESS, WICKING, AND SOLVENT DRYING CHARACTERISTICS

Wayne C. Sigl, Black Creek, and Frederick O. Lassen, Neehah, both of Wis., assignors to Kimberly-Clark Corporation, Neeah, Wis.

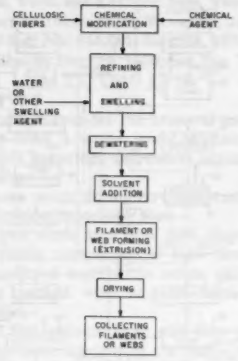
Filed Apr. 2, 1975, Ser. No. 564,201

Int. Cl.[2] D01D *5/08*

U.S. Cl. 264—178 F **7 Claims**

1. In a method of producing filaments and webs of cellulose

fibers, which have been transformed by derivitization to increase their hydrophilic character, by extrusion of said fibers from a plasticized fibrous extrudable mass including a swelling medium and solvent drying to remove the swelling medium,



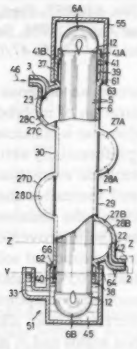
the improvement wherein about 2 to 50% of a polar solvent in the form of pure solvent for the swelling medium being removed by drying or a mixture containing the solvent and up to 90% of a non-solvent by volume is added to said extrudable mass and mixed for a period of from about three to about ten minutes prior to extrusion.

4,049,765

METHOD FOR SETTING END PORTION OF BUNDLE OF THREAD-LIKE BODIES

Masahiro Yamazaki, Kamakura, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1976, Ser. No. 679,988
Claims priority, application Japan, May 2, 1975, 50-53614
Int. Cl.[2] B29C *17/00*; B29D *9/00*; B29C *27/00*
U.S. Cl. 264—261 **11 Claims**



1. A method for setting an end portion of a bundle of thread-like bodies so that capillary action is reduced between said bodies, comprising the steps of:

A. dipping an end portion of a bundle of thread-like bodies into a solidifiable liquid, said bodies being so disposed that capillaries exist between said bodies;

B. contacting at least that part of said bundle which is immediately adjacent said end portion with a polar gas selected from the group consisting of ammonia gas, a primary amine gas and a secondary amine gas and mixtures thereof, said contacting step occuring prior to exposure of that adjacent part to said liquid whereby said gas acts to prevent said capillary action; and

C. permitting said solidifiable liquid to solidify.

4,049,766

PROCESS FOR IMPROVING CRYSTALLINITY IN NYLON 6

Brewster B. Eskridge; Boyce M. Lyon, both of Asheville, N.C., and Eduard H. Boasson, Laag Soeren, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 530,902, Dec. 9, 1974, abandoned, which is a division of Ser. No. 418,487, Nov. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 217,839, Jan. 14, 1972, abandoned. This application Jan. 12, 1976, Ser. No. 648,425
Int. Cl.[2] D01D *5/12*
U.S. Cl. 264—210 F **7 Claims**

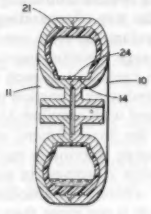
1. A process for the continuous spin-draw-winding of nylon 6 to produce yarn filaments having a mixed beta/alpha crystallinity ratio comprising the steps of spinning continuous filaments of nylon 6, cooling said filaments in air, applying to the filaments an aqueous spin finish emulsion containing from about 3% to about 6% by weight of benzyl alcohol to enhance conversion of the beta hexagonal crystalline form to the alpha monoclinic crystalline form, and immediately thereafter continuously drawing said nylon 6 yarn filaments thereby imparting improved uniformity of dye acceptance to the drawn filaments.

4,049,767

ROTATIONAL MOLDING PROCESS FOR FORMING A CLOSED HOLLOW TOROIDAL ARTICLE

Deepak V. Vaidya, (Sailee) Plot No. 9, Baner Road, Pune, Maharashtra 411007, India

Continuation-in-part of Ser. No. 512,176, Oct. 4, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,082
Int. Cl.[2] B29C *5/04*; B29H *17/00*
U.S. Cl. 264—257 **13 Claims**



1. A process for molding a closed hollow toroidal article thickest at its outer periphery, which comprises charging one part of a split hollow toroidal mold with a fluent material which can be caused to set to a solid, in a quantity substantially less than that required to fill the mold cavity but sufficient to fill completely the lower arc of the mold cavity when such that the fluent material is in contact with all portions of the cross-sectional periphery of the lowermost radial section of the toroidal mold its axis is horizontal, completely closing the mold, placing the mold with its axis horizontal, slowly rotating the mold on its axis, causing the material to set progressively from the inner surface of the mold until the entire charge of material is solidified, opening the mold, and removing the article.

4,049,768

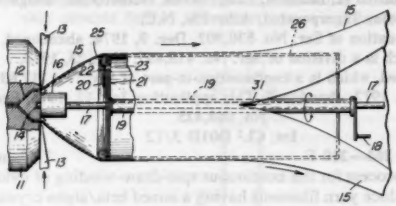
METHOD FOR EXTENDING THERMOPLASTIC FOAMS HAVING SMOOTH EXTERNAL SKINS

Vinod K. Luthra, East Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 9, 1976, Ser. No. 675,384
Int. Cl.[2] B29D *7/24, 27/00*
U.S. Cl. 264—45.5 **1 Claim**

1. In a method for the surface treatment of extruded tubular thermoplastic foams wherein an internal nozzle and an external

cooling ring are employed to cool the foam surface and form continuous skin layers thereon and wherein the foam tube subsequent to forming is drawn over the cylindrical surface of a forming drum, the improvement which comprises providing



and utilizing an air vent in the face portion of said forming, drum said air vent comprising an orifice having an adjustable baffle whereby the return flow of cooling air from the interior of the extruded tube is controlled resulting in alterations in the characteristics of said skin layers.

4,049,769

SEPARATION OF URANIUM ISOTOPES BY ACCELERATED ISOTOPE EXCHANGE REACTIONS

Maomi Seko; Tetsuya Miyake, both of Tokyo; Kohji Inada, Yokohama; Kazushi Ochi, Yokohama, and Tomio Sakamoto, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 4, 1976, Ser. No. 711,748
Int. Cl.[2] C01G *56/00*
U.S. Cl. 423—7 **25 Claims**

1. In a process for separating uranium isotopes in multiple stages, each stage comprising the step of isotope exchange reaction wherein uranium(VI) and uranium(IV) compounds are contacted in a system containing a mixed solution of said compounds and the step of separating uranium(VI) compound enriched with uranium-235 from uranium(IV) compound after said isotope exchange reaction, uranium(VI) and uranium(IV) compounds to be contacted in each stage after the first stage being formed by reducing a portion of respective uranium(VI) compound enriched with uranium-235 isotope separated in the preceding stage, the improvement which comprises effecting said isotope exchange reaction in each stage in the presence of at least one catalyst dissolved in said mixed solution under acidic conditions wherein the absolute value of the differential redox potential ΔE is not more than one volt and the concentration of the catalyst expressed in moles per liter is in the range between 0.5 times $|\Delta E|$ and three.

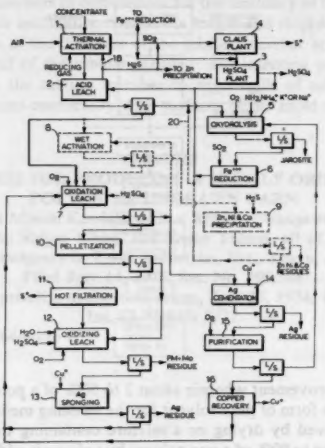
4,049,770

RECOVERY OF COPPER AND ZINC AS SULFIDES FROM COPPER-IRON SULFIDES

Godefridus Maria Swinkels, Rossland; Robert Arthur Furber, Edmonton; Edward Francis Godfrey Milner, Warfield; Roman Michael Genik-Sas-Berezowsky, Edmonton, and Charles Ray Kirby, Rossland, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto and Cominco Ltd., Vancouver, both of Canada

Division of Ser. No. 408,132, Oct. 19, 1973, Pat. No. 3,964,091.
This application Mar. 2, 1076, Ser. No. 663,038
Int. Cl.[2] C01G *3/12, 9/08, 51/00, 53/00*
U.S. Cl. 423—37 **3 Claims**

1. A process for recovery of zinc values contained in thermally activated iron containing copper and zinc sulfides in which said activated sulfides have been subjected to an acid leach in aqueous sulfuric acid to produce a solution of ferrous sulfate and a solids residue containing copper and zinc and separation of said solution containing ferrous sulfate from said solids residue which comprises: reacting said solids residue containing copper and zinc with an acidic copper sulfate solution containing from about 20 to about 100 gpl copper and from about 5 to about 35 gpl sulfuric acid at a temperature in the range of from about 140° to about 200° C. under autogenous pressure whereby copper values are precipitated as a simple copper sulfide with concurrent dissolution of iron and zinc values to form a solution of ferrous sulfate containing said



dissolved zinc values, separating said solution of ferrous sulfate from the simple coppeer sulfides, and reacting said solution with H_2S for precipitation of zinc values therefrom as zinc sulfide.

4,049,771

EXTRACTION PROCESS FOR RECOVERY OF RHENIUM

L. Rita Quatrini, and Martin B. MacInnis, both of Towanda, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 510,067, Sept. 27, 1974, abandoned.
This application Aug. 9, 1976, Ser. No. 712,817
Int. Cl.[2] C01G *47/00*
U.S. Cl. 423—49 **2 Claims**

1. In a process wherein an aqueous solution containing a relatively high concentration of molybdenum and a relatively low concentration of rhenium is contacted by selective organic extractant solution to preferentially extract the rhenium therefrom without an appreciable extraction of molybdenum into the organic solution and thereafter the organic and aqueous solutions are separated and the rhenium values are separated from the organic phase, the improvement comprising:

a. providing an organic extractant solution consisting essentially of from at least 0.05% to about 0.1% by volume of a quaternary ammonium compound of the formula $[R_3(CH_3)N]^+A^-$, wherein R is an alkyl group having from about 8 to 10 carbon atoms and A is an anion derived from a mineral acid as the active extracting agent and at least 50% by volume of benzene, and contacting said organic extractant with an aqueous solution containing molybdenum and rhenium values, wherein the ratio of concentration of rhenium to the concentration of molybdenum is from about 1:2000 to about 1:3000 and the concentration of rhenium is below about 50 mg/liter.

b. stripping essentially all of the rhenium value from said extractant after the aqueous solution has been contacted by said extractant and the organic and aqueous solutions have been separated, and

c. Continuously recycling said extractant solution to extract further rhenium values without a substantial loss in extraction capacity.

4,049,772

PROCESS FOR THE RECOVERY OF CHROMIC ACID SOLUTION FROM WASTE WATER CONTAINING CHROMATE IONS

Shunsuke Takada, Yono, and Kazunori Sato, Yokohama, both of Japan, assignors to Tokico, Ltd., Kawasaki, Japan

Continuation of Ser. No. 524,881, Nov. 18, 1974, abandoned. This application Dec. 29, 1976, Ser. No. 755,193

Int. Cl.[2] C01G *37/14*

U.S. Cl. 423—54 **4 Claims**

1. A continuous process for the removal and recovery of chromate anions from a waste water containing chromate anions, other anion impurities and cation impurities, and said process comprising:

passing the waste water through a cation-exchange resin to remove the cation impurities; then

passing the waste water in a flow path through an anion-exchange system comprising at least first and second columns connected together in series, each of said columns being packed with an OH form basic anion-exchange resin;

removing said first column from said flow path when or after the chromate content of the influent to said first column and the effluent from said first column have become substantially equal and diverting said waste water, at the time of the removal of said first column from said flow path, to enter said second column;

eluting absorbed chromate ions from said first column by passing a chromic acid solution containing at least 100 ppm chromate anions through said first column and thereafter passing an aqueous alkali solution through said first column; and

replacing said first column back into said system by connecting it to the effluent end of the last column in series.

4,049,773

PROCESS FOR PRECIPITATION OF ALUMINUM HYDROXIDE FROM ALUMINATE SOLUTION

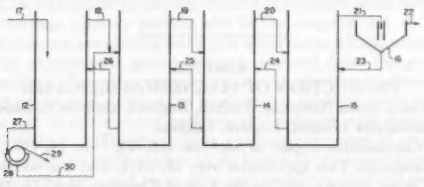
Glør Thorvald Mejdell, and Sven Arne Kjølberg, both of Porsgrunn, Norway, assignors to Norsk Hydro A.S., Olso, Norway

Filed Apr. 8, 1976, Ser. No. 675,216

Claims priority, application Norway, Apr. 16, 1975, 751367

Int. Cl.[2] C01F *7/06*

U.S. Cl. 423—127 **10 Claims**



1. A process for continuous precipitation of aluminum hydroxide from an aluminate solution produced by digestion of bauxite in concentrated sodium hydroxide solutions at elevated pressure and temperature with subsequent separation of undissolved components, where the precipitation is carried out in more than one stage and in the presence of seed crystals, and where the precipitated aluminum hydroxide after washing can be transformed to oxide by heating to temperatures over 700° C., while the mother liquor remaining after the precipitation is concentrated by evaporation and returned for reuse in the digestion of bauxite, said process comprising:

passing the aluminate mother liquor counter-current to a feed of aluminum hydroxide crystals through at least two precipitation stages arranged in series;

maintaining in each precipitation stage a lower turbulent zone with a high suspension density, and agitating said zone sufficiently to maintain crystals therein suspension;

maintaining over each turbulent zone a non-turbulent, stagnant liquid layer from which the majority of the crystals settle back into the respective lower turbulent zone;

maintaining the density in the last as well as preceding precipitation stages at a constant level by sending crystal suspension from the lower turbulent zone in all precipitaton stages but the first to the preceding precipitation stage;

removing mother liquor from the upper stagnant zone of all but the last stages and sending such removed mother liquor to the following stage; and

removing coarse crystal suspension from the turbulent zone in said first stage for separation of the crystals for further processing, while returning the remaining mother liquor to the system.

4,049,774

PROCESS FOR REDUCING FORMATION OF GYPSUM SCALE DURNG THE WASHING OF CALCIUM SULPHATE HEMIHYDRATE CRYSTALS

Douglas Charles Harper, Ipswich; Norman Robinson, and Stanislaw Maria Janikowski, both of Felixstowe, all of England, assignors to Fisons Limited, London, England

Continuation-in-part of Ser. No. 300,575, Oct. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 198,425, Nov. 21, 1971, abandoned. This application Nov. 8, 1974, Ser. No. 522,265

Claims priority, application United Kingdom, Nov. 12, 1970, 53869/70; Jan. 16, 1971, 2225/71; Sept. 24, 1971, 44560/71; Oct. 30, 1971, 50564/71; May 5, 1972, 20966/72; May 5, 1972, 20967/72; May 11, 1972, 22176/72

The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.

Int. Cl.[2] C01B *25/22*

U.S. Cl. 423—167 **10 Claims**

1. In a process for producing phosphoric acid wherein phosphate rock is acidulated with a mineral acid and crystals of calcium sulphate hemihydrate are formed, separated off from the phosphoric acid and thereafter washed, the improvement which comprises washing the calcium sulphate hemihydrate crystals with an aqueous wash liquor which prior to contact with the crystals, contains P_2O_5 in amounts less than 30% and H_2SO_4 in amounts of less than 10 parts by weight per 100 parts by weight of H_3PO_4 present in the aqueous wash liquor and contains from 0.0002 to 1.0% by weight of an additive selected from the group consisting of compounds of the empirical general formula:

$$R^1R^2S(O)_n \qquad I$$

wherein n has a value of 3 or 4 and when n is 3 R^2 is hydrogen and R^1 is an alkyl or aralkyl group and when n is 4 R^1 is an alkyl or aralkyl group and R^2 is hydrogen or an R^1 group; alkylene oxide condensates of an alcohol, phenol or an alkyl phenol and mixtures and salts, esters and amides of said compounds whereby the deposition of calcium sulphate dihydrate scale due to the recrystallisation of the calcium sulphate hemihydrate to calcium sulfate dihydrate is reduced; the total contact time between the calcium sulphate hemihydrate crystals and the wash liquor during washing being less than 10 minutes.

4,049,775

METHOD FOR PURIFYING WASTE AIR FROM SULPHURIC GASES, PARTICULARLY IN THE PRODUCTION OF VISCOSE FIBRES

Janina Majewska; Wiktor Grams; Zbigniew Rybicki, and Jozef Banasiak, all of Lodz, Poland, assignors to Instytut Wlokien Chemicznych, Lodz, Poland

Filed Oct. 10, 1975, Ser. No. 621,626

Claims priority, application Poland, Oct. 15, 1974, 174848

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—224 **9 Claims**

1. A method for purifying waste air simultaneously from hydrogen sulphide, carbon disulphide and sulphur dioxide

comprising contacting said waste air in a closed cycle with an aqueous alkaline solution of an oxidizing agent consisting of (1) an alkali metal hypochlorite in an amount equivalent to at least 0.1 g. of available chlorine per liter (2) hydroquinone in an amount of at least 0.1 g/l and (3) at least 0.005 g/l of a chemisorbent selected from the group consisting of polyglycols having a molecular weight less than 300 and aliphatic amines.

4,049,776

METHOD OF REMOVING HYDROGEN SULFIDE FROM GASES AND LIQUIDS

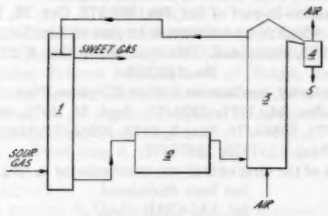
Thomas Nicklin, Bamford, and Dorothy Hughes, Manchester, both of England, assignors to British Gas Corporation, London, England

Filed Aug. 21, 1975, Ser. No. 606,545

Claims priority, application United Kingdom, Aug. 27, 1974, 37418/74

Int. Cl.² B01D *53/34*

U.S. Cl. 423—226 **6 Claims**



1. In a process for the removal of hydrogen sulphide from gases or non-polar liquids by contacting said gas or liquid with an aqueous alkaline liquor comprising a quinone and a compound of a metal having at least two valency states, and in which said liquor contains an impurity selected from the group consisting of sulfonated, hydroxy, and hydroxy sulfonated derivatives of said quinone, the improvement wherein said aqueous alkaline liquor is prepared by adding ferrous or ferric ions to an aqueous solution of said quinone, at a pH of less than 7, to form a complex with said impurity, said complex being selected from ferric ion sulphonated quinones, ferric ion hydroxy quinones and ferric ion sulphonated hydroxy quinones and thereafter adding the acid solution of said complex to an aqueous solution of said compound of a metal having at least two valency states, whereby to form said aqueous alkaline liquor, and whereby said liquor has a pH above pH 7.

4,049,777

METHOD OF WASTE GAS TREATMENT

Rudolf Divivier, Kettwig, and Gotthard Uckert, Essen, both of Germany, assignors to Didier Engineering GmbH, Essen, Germany

Filed May 20, 1976, Ser. No. 688,302

Int. Cl.² B01D *53/34*

U.S. Cl. 423—239 **11 Claims**

1. A method of removing nitrogen oxides from a feed stock containing at least 10% by volume of oxygen and/or at least 12% by volume of oxygen compounds other than the nitrogen oxides, which comprises providing at least two separate beds of a catalyst comprising at least one oxide of the iron group and at least one oxide of the chromium group, and passing the feed stock sequentially through the catalyst beds while simultaneously introducing ammonia into the feed stock prior to passage of the feed stock through each catalyst bed, thus causing the nitrogen oxides to undergo a reduction reaction, said reduction reaction being carried out at a temperature between 260° C and 350° C.

4,049,778

PARTICULATE AMMONIUM NITRATE WITH ADDED FERRIC PHOSPHATE AND CALCIUM SULFATE

Clive Hodgson, Forest Knolls, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 107,426, Jan. 18, 1971, abandoned. This application May 3, 1973, Ser. No. 356,886

Int. Cl.² C01C *1/18*

U.S. Cl. 423—265 **12 Claims**

1. A composition of matter comprising solid particulate ammonium nitrate prepared in situ by mixing with aqueous or molten ammonium nitrate sufficient soluble ferric salt and phosphoric acid in substantially stoichiometric amounts adapted to form ferric phosphate in an amount from 0.3 to 2 weight percent, based on weight of ammonium nitrate, and subsequently prilling or granulating the ammonium nitrate.

4,049,779

CRYSTALLINE SALT MONOMERS FOR STABLE PHOSPHATE GLASSES

Richard C. Ropp, Warren, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 24, 1975, Ser. No. 644,270

Int. Cl.² C01B *15/16, 25/26;* C03C *3/00*

U.S. Cl. 423—309 **19 Claims**

1. A method of preparing a water soluble monobasic phosphate glass precursor having the formula:

$$M(H_2PO_4)_n$$

wherein M is a metal ion selected from the group consisting of aluminum, zinc, cadmium, iron, tin, manganese, lead, nickel, cobalt, gallium, indium and the alkaline earth metals beryllium, magnesium, calcium, strontium and barium, and wherein *n* has a value of 2 or 3 depending on whether M is a divalent or trivalent ion, in essentially pure monobasic form which comprises dissolving a compound supplying said metal ion M in a controlled execess of phosphoric acid to form a stoichiometrically proportioned solution, adding a precipitating agent, effective to precipitate soluble transition metal impurities other than the selected metal ion removing formed insolubles to produce an essentially pure solution, forming a crystal product from the resulting purified solution by evaporation, and washing said crystal product substantially free of phosphoric acid to yield a stoichiometrically proportioned crystalline phosphate salt.

4,049,780

PRODUCTION OF MAGNESIUM SILICATES

Barbara Susan Neumann, Redhill, England, assignor to Laporte Industries Limited, London, England

Continuation-in-part of Ser. No. 415,701, Nov. 14, 1973, abandoned. This application May 18, 1976, Ser. No. 687,499

Claims priority, application United Kingdom, Nov. 14, 1972, 52416/72

Int. Cl.² C01B *33/22, 33/24, 33/32*

U.S. Cl. 423—331 **10 Claims**

1. A process for the synthesis of a hydrous magnesium silicate having an X-ray diffraction pattern indicative of a hectorite structure and having a Bingham Yield Value of from 40 to 250 dynes/cm² and having the general formula

$$[Si_8(Mg_aLi_bH_c)O_{20}(OH)_{4-y}F_y]^{z-}ZM^+$$

wherein *a, b, c, y, z* and M have the values:

a is 4.95 to 5.7
b is from 0 to 1,05
c is from 0 to 2
$a+b+c$ is from 4 to 8
y is from 0 to 4
$z = 12-2a-b-c$
M is Na+ or Li+

comprising the steps of:

a. forming an aqueous suspension of mangesium carbionate by dissolving a suitable water soluble magnesium compound in water, precipitating magnesium carbonate by adding to the resulting solution an aqueous solution of sodium carbonate;
b. adding to a suspension of the freshly precipitated magnesium carbonate a water soluble silicon compound;
c. precipitating silica into the suspension of freshly precipitated magnesium carbonate by recting the water soluble silicon compound with sodium carbonate;

the total time for addition in step (a) and in step (b) being at least 30 minutes,

d. adding during or after step (a) or (b) or (c) lithium or fluorine ions if required by the general formula above;
e. controlling the quantity of magnesium carbonate and silicon precipitated and the quantity of lithium or fluorine ions added to give a Si:Mg:Li:F ratio within the ranges stated in the general formula above;
f. controlling the concentrations of the reactants used in steps (a), (b) and (e) to give a suspension having a concentration of solids at least 5% by weight;
g. maintaining the solids in the wet state;
h. treating the wet solids as a suspension having a concentration of at least 5% by weight in water in the presence of an excess of sodium or lithium ions from 25 to 250% over that providing the cation M in the general formula above by heating it to cause crystal growth of the hydrous magnesium silicate of the above formula for from 1 to 20 hours at a pressure at least equal to atmospheric pressure while maintaining the presence of water in the liquid state; and
i. separating the resulting crystalline hydrous magnesium silicate.

4,049,781

METHOD OF PREPARING LOOSELY AGGREGATED 200-500 MILLIMICRON SILICA

Ellsworth George Acker, Baltimore, and Milton Edward Winyall, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 412,359, Nov. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 156,088, June 23, 1971, abandoned. This application Sept. 10, 1975, Ser. No. 612,041

Int. Cl.[2] C01B *33/12*

U.S. Cl. 423—338 **6 Claims**

1. A method of producing loosely aggregated silica having an average primary particle size in the range of 200 to 500 millimicrons comprising adding an alkali metal silicate solution to an ammoniated gelling solution selected from the group consisting of an ammoniated formic acid solution, an ammoniated acetic acid solution, an ammoniated propionic acid solution and an ammoniated carbonic acid solution, said ammoniated gelling solution containing a substantial excess of ammonia and having a pH of 10 to 11, to form a slurry of said loosely aggregated silica and recovering said loosely aggregated silica.

4,049,782

PROCESS FOR PRODUCING PURE CONCENTRATED AMMONIA

Fritz Wöhler, Frankfurt am Main; Hans-Martin Stönner, Schwalbach, and Paul Wiesner, Oberursel, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 3, 1976, Ser. No. 663,233

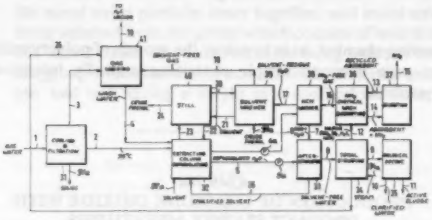
Claims priority, application Germany, Nov. 14, 1975, 2551097

Int. Cl.[2] C01C *1/02, 1/10*; B01D *19/00*

U.S. Cl. 423—352 **7 Claims**

1. A process for the recovery of pure concentrated ammonia from a gas water resulting from the condensation or washing of coal degasification or coal gasification gases comprising the steps of:

a. filtering said gas water;
b. extractng the filtered gas water of step (a) with di-isopropyl ether as a dephenolating solvent to produce a dephenolated water containing NH_3, HCN and traces of residual solvent and a phenol-laden solvent phase;
c. recovering solvent from phenols of said solvent phase and recycling the recovered solvent to step (b);
d. stripping the dephenolated gas water of step (b) to produce a gas phase containing CO_2, H_2S, HCN, NH_3 and residual solvent;
e. chemically washing ammonia from the gas phase of step (d) to produce a substantially ammonia-free gas phase and an ammonia-laden absorbent phase;
f. separating ammonia from said absorbent of the ammonia-



laden absorbent phase, collecting the separated ammonia product, and recycling said absorbent to step (e);
g. washing HCN from the ammonia-free gas phase of step (e) to produce a gas containing traces of residual solvent;
h. scrubbing residual solvent from the gas of step (g) with circulating phenol to produce a phenol-scrubbed gas and a solvent containing phenol;
i. distilling solvent containing phenol produced in step (h) to separate the solvent thereof from the phenol delivering the solvent to step (b) and returning the phenol to step (h); and
j. afterscrubbing the phenol-scrubbed gas of step (h) at least in part with filtered gas water from step (a).

4,049,783

METHOD OF PRODUCING POLYCRYSTALLINE DIAMONDS

Leonid Fedorovich Vereschagin, Kutuzovsky prospekt, 2/1, kv. 231; Evgeny Nikolaevich Yakovlev, ulitsa Rusakovskaya, 4, kv. 63, both of Moscow; Tatyana Dmitrievna Varfolomeeva, p/o Akademgorodok, ulitsa Shkolnaya, 6, kv. 35, Moskovskaya Oblast, Podolsky Raion; Alexandr Yakovlevich Preobrazhensky, ulitsa Profsojuznaya, 52, korpus 5, kv. 21, Moscow; Vladislav Nikolaevich Slesarev, ulitsa Televidenia, 6/2, korpus 5, kv. 21, Moscow; Vasily Alexandrovich Stepanov, ulitsa Televidenia, 6/2, korpus 2, kv. 32, Moscow, and Ljudmila Efimovna Shterenberg, ulitsa B. Dekabrskaya, 4, kv. 21, Moscow, all of U.S.S.R.

Continuation of Ser. No. 92,405, Nov. 24, 1970, abandoned. This application Jan. 2, 1973, Ser. No. 320,679

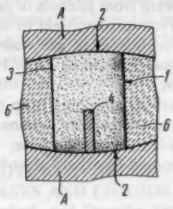
Claims priority, application U.S.S.R., Jan. 4, 1970, 1513780

Int. Cl.[2] C01B *31/06*

U.S. Cl. 423—446 **5 Claims**

1. A method for producing polycrystalline diamonds which comprises: filling a reaction chamber of a device for developing high pressure and high temperatures and having cooled portions with a carbon material; subjecting the carbon material in the presence of a metal catalyst to the simultaneous action of high pressures of at least 80 kbar and diamond synthesizing temperatures of at least about 1,200° C and approaching the minimum temperature of diamond synthesis with the given metal catalyst for a period of time sufficient to obtain diamond crystallization; maintaining said reaction chamber in thermal contact with said cooled portions so as to effect removal of heat developed therein in the course of diamond crystallization at a rate of not less than 25 cal/min, said metal catalyst having a cross-sectional area of not more than 0.04 of the area of

transverse section of said reaction chamber and being positioned in the carbon material substantially in the center of said



reaction chamber, so as to ensure the growth of polycrystalline fine-grain diamond sample containing mutually intergrown crystallites.

4,049,784

PRODUCTION OF CHLORINE DIOXIDE WITH PRODUCT SLURRY METATHESIS

Willard A. Fuller, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 556,379, March 7, 1975, Pat. No. 3,976,758. This application May 24, 1976, Ser. No. 689,405

The portion of the term of this patent subsequent to Aug. 24, 1993, has been disclaimed.

Int. Cl.[2] C01B *11/02*

U.S. Cl. 423—478 **24 Claims**

12. In a process for continuously generating a mixture containing chlorine dioxide, chlorine and sulfate wherein

a. an alkali metal chlorate, a chloride and a mineral acid selected from sulfuric acid and mixtures of sulfuric acid and a member of the group consisting of hydrochloric acid and phosphoric acid are continuously reacted in a single vessel generator-evaporator-crystallizer in proportions to generate chlorine dioxide and chorine;

b. the temperature is maintained within a range of from about 50° to about 100° centrigrade;

c. the acidity of the reaction solution is maintained within the range of from about 2 to about 5 normal;

d. the reaction solution is subjected to a vacuum of from about 100 to about 400 millimeters of mercury absolute to effect evaporation of water vapor;

e. chlorine dioxide and chlorine produced by said reaction is withdrawn in admixture with said water vapor, and the reaction is conducted in the presence of at least one catalyst selected from the group consisting of vanadium pentoxide silver ions, manganese ions, dichromate ions and arsenic ions, and

f. neutral alkali metal salt is crystallized within said single vessel generator-evaporator-crystallizer and withdrawn therefrom;

the improvement which comprises

continuously passing the slurry containing neutral alkali metal salt crystals and chlorate values produced in said single vessel generator-evaporator-crystallizer into the top of a metathesis column, in a downward flow;

countercurrently passing a stream of aqueous metathesis solution upwardly through said column at a rate and in amounts sufficient to effect reaction of said solution with said alkali metal salt, converting said alkali metal salt to the salts of the metathesis solution, continuously returning chlorate, chloride and acid values substantially completely to said single vessel generator-evaporator-crystallizer; and

continuously removing the salts of the metathesis solution slurry from the bottom of said metathesis column.

4,049,785

PRODUCTION OF CHLORINE DIOXIDE WITH PRODUCT SLURRY METATHESIS

Willard A. Fuller, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 620,452, Oct. 7, 1975, Pat. No. 3,974,266, which is a division of Ser. No. 556,379, March 7, 1975, Pat. No. 3,976,758. This application May 24, 1976, Ser. No. 689,406

The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.

Int. Cl.[2] C01B *11/02*

U.S. Cl. 423—478 **13 Claims**

1. In a process for continuously generating a mixture containing chlorine dioxide, chlorine and sulfate wherein

a. an alkali metal chlorate, a chloride and a mineral acid selected from sulfuric acid and mixtures of sulfuric acid and a member of the group consisting of hydrochloric acid and phosphoric acid are continuously reacted in a single vessel generator-evaporator-crystallizer in proportions to generate chlorine dioxide and chlorine;

b. the temperature is maintained within a range of from about 50°to about 100° centigrade;

c. the acidity of the reaction solution is maintained within the range of from about 4 to about 12 normal;

d. the reaction solution is subjected to a vacuum of from about 100 to about 400 millimeters of mercury absolute to effect evaporation of water vapor;

e. chlorine dioxide and chlorine produced by said reaction is withdrawn in admixture with said water vapor, and

f. alkali metal salt is crystallized within said single vessel generator-evaporator-crystallizer and withdrawn therefrom;

the improvement which comprises

continuously passing the slurry containing alkali metal salt crystals and chlorate values produced in said single vessel generator-evaporator-crystallizer into the top of a metathesis column, in a downward flow;

countercurrently passing a stream of aqueous metathesis solution upwardly through said column at a rate and in amounts sufficient to effect reaction of said solution with said alkali metal salt, converting said alkali metal salt to the salts of the metathesis solution, continuously returning chlorate, chloride and acid values substantially completely to said single vessel generator-evaporator-crystallizer; and

continuously removing the salts of the metathesis solution slurry from the bottom of said metathesis column.

4,049,786

PROCESS OF PREPARING PEROXYMONOSULFATE

John S. Chiang, Mercerville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Sept. 13, 1976, Ser. No. 723,188

Int. Cl.[2] C01B *15/08*

U.S. Cl. 423—513 **3 Claims**

1. A method of preparing a peroxymonosulfate by rapid hydrolysis of a peroxydisulfate with concentrated sulfuric acid, wherein active oxygen losses during said hydrolysis are suppressed, comprising the steps:

a. providing a solution of a soluble peroxydisulfate at a temperature of about 100° F;

b. mixing the peroxydisulfate solution of step (a) with concentrated sulfuric acid in a volume ratio of peroxydisulfate solution to concentrated sulfuric acid of 1 to 0.07 to 1 to 0.15, whereby the heat of solvation of the sulfuric acid initiates the hydrolysis reaction and produces a solution temperature between about 140° to 160° F;

c. maintaining said solution temperature of 140° to 160° F for about 5 to 45 minutes; and

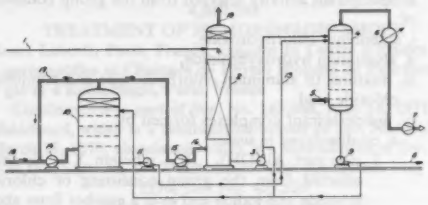
d. rapidly cooling the reaction to about room temperature.

4,049,787

PROCESS FOR SEPARATING SULPHUR IN THE FORM OF HYDROGEN SULPHIDE FROM CLARIFIED GREEN LIQUOR OBTAINED FROM THE COMBUSTION OF WASTE LIQUOR

Hakan Wilhelm Romantschuk, and Tuomo Juhani Vuojolainen, both of Tampere, Finland, assignors to Oy Tampella AB, Finland

Filed Oct. 16, 1974, Ser. No. 515,424
Claims priority, application Finland, Nov. 28, 1973, 733671
Int. Cl.[2] C01B *17/16*
U.S. Cl. 423—563 **1 Claim**



1. In a process for separating sulphur in the form of hydrogen sulphide from clarified green liquor obtained from the combustion of waste liquor, including the steps of precarbonating green liquor with a carbon dioxide rich gas, adding alkali bicarbonate to said precarbonated green liquor, stripping hydrogen sulphide therefrom producing simultaneously alkali carbonate, and preparing alkali bicarbonate to be used in the process by carbonating said alkali carbonate, the improvement comprising carrying out said hydrogen sulphide stripping step producing simultaneously alkali carbonate directly in the solution in said stripping step without crystallizing said simultaneously produced alkali carbonate, preparing said alkali bicarbonate to be used in the process partly from said alkali carbonate solution and partly from alkali carbonate — alkali sulphide solution obtained in said pre-carbonation step, feeding at least a portion of said alkali carbonate — alkali sulphide solution through said carbonation step to said hydrogen sulphide stripping step, introducing said carbon dioxide rich gas first into said carbonation step and thereafter passing a portion of the gas escaping from said carbonation step back to said carbonation step, and passing another portion into said precarbonation step, and thereafter removing said gas from the process.

4,049,788

THERMAL TRANSFORMATION OF METAL CHLORIDES TO OXIDES IN A FLUIDIZED BED

Herbert Bierbach; Heinz Dittmar; Ernst Heinz, all of Frankfurt am Main; Klaus Hohmann, Neuenhain, and Rolf Rennhack, Schwalbach, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 392,995, Aug. 30, 1973, abandoned. This application Oct. 17, 1975, Ser. No. 623,248
Claims priority, application Germany, Dec. 14, 1972, 2261083
Int. Cl.[2] C01G *49/02, 53/04, 1/02*
U.S. Cl. 423—592 **2 Claims**

1. A process for the thermal conversion of a metal chloride to a metal oxide comprising the steps of:

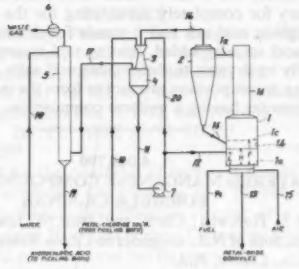
forming a fluidized bed of particles of said metal oxide having height minimum oxygen-containing of 350 mm in a nonfluidized state of the bed within a fluidized-bed chamber;

fluidizing said bed by introducing at the bottom of said chamber of free oxygen-containing fluidizing gas at a velocity so that reaction gases are obtained having a velocity W_G, determined by the relationship $0.34\rho^{0.9} \leqq W_G \leqq 0.56\rho^{0.9}$ where ρ is the density of the metal oxide in g/cm³, and W_G is the velocity in meters/second measured in the empty reactor, the reaction gases being the resulting gases produced by combustion of the fuel with the fluidizing free-oxygen-containing gas, gases produced by evaporation of water or thermal release of water from a feed containing the metal chloride, and gases produced by chemical reaction with the metal chloride;

maintaining said fluidized bed at the height upon fluidization thereof such that the pressure drop across said bed is between 1200 and 2400 mm (water column);

introducing said metal chloride in solution into said bed at a location at least 250 mm above the entrance of the fluidizing gas and below the top of the fluidized bed;

maintaining the fluidized bed at a temperature between the thermal reaction temperature of the metal chloride for formation of the metal oxide and the temperature at which the metal oxide particles sinter together, said metal oxide being selected from the group which consists of iron oxide and nickel oxide, said metal chloride being selected from the group which consists of iron chloride and nickel chloride, said bed having a height in a nonfluidized state of



substantially 350 to 750 mm for the iron; oxide and 350 to 650 mm for the nickel oxide and said temperature ranging between substantially 800° C and 1100° C.;

recovering from said bed an effluent gas containing hydrogen chloride and metal oxide particles;

separating metal oxide particles from said effluent gas in a cyclone and returning the metal oxide particles separated from said effluent gas in the cyclone to said bed below the top of the fluidizing bed; scrubbing the effluent gas flowing separation of oxide particles therefrom in said cyclone, in a venturi scrubber with a liquor containing metal chloride in solution thereby concentrating the metal chloride in said liquor and entraining residual metal oxide particles from said effluent gas, said liquor being fed to said bed from said scrubber; and substantially continuously withdrawing metal oxide granules from said bed at said bottom of said chamber at a rate sufficient to maintain the top of said bed at a constant level, said metal chloride in solution being continuously introduced into said bed.

4,049,789

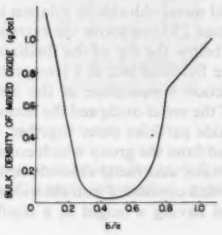
PROCESS FOR PREPARATION OF MIXED OXIDE POWDERS

Toshikatsu Manabe, Ohme; Masao Ohta, Kure; Tetsuichi Kudo, Tokyo; Shouji Mochizuki, Hachioji, and Tetsuo Gejyo, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi K.K., both of Tokyo, Japan

Filed June 20, 1975, Ser. No. 588,901
Claims priority, application Japan, July 10, 1974, 49-78314
Int. Cl.[2] C01G *49/00*; C01F *17/00*; C01G *23/00*
U.S. Cl. 423—593 **5 Claims**

1. A process for the preparation of complex oxide powder having a high specific surface area and a low bulk density which comprises the steps of preparing an aqueous solution of salts of the metallic elements of said complex oxide and nitric acid, said complex oxide being at least one member selected from the group consisting of complex oxides with perovskite crystal structure and complex oxides with K_2MgF_4 crystal

structure, wherein said solution contains said metallic elements in the proportion of the constituent metallic elements of said complex oxide, at least one of said salts being an organic acid salt and said nitric acid being present in said solution in such an amount that a ratio b/a is within a range of from 0.2 to 0.8, wherein a stands for the minimum molar amount of nitric acid



necessary for completely substituting for the organic acid of said organic acid salt and b stands for the molar amount of nitric acid actually added, heating said aqueous solution substantially to dryness to decompose said salts and heating the resulting decomposition product to form the intended complex oxide powder having a uniform composition.

4,049,790

LAYERED MANGANESE COMPOUND OF THE FORMULA $CA_2MN_3O_8$

Harold S. Horowitz, Clark, and John M. Longo, New Providence, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed June 3, 1976, Ser. No. 692,595
Int. Cl.[2] C01G *45/12*
U.S. Cl. 423—599 **2 Claims**

1. A pure, single phase compound having a monoclinic structure and the approximate parameters $a = 11.01$ A, $b = 5.84$ A, $c = 4.95$ A, $\alpha = 90°$, $\beta = 109.80°$, $\gamma = 90°$ of the formula $Ca_2Mn_3O_8$.

4,049,791

PROLONGED ACTING APPETITE SUPPRESSANT AND ANTI-OBESITY COMPOSITIONS CONTAINING AMPHETAMINE ADIPATE, DEXTROAMPHETAMINE ADIPATE, AMPHETAMINE SULFATE AND DEXTROAMPHETAMINE SULFATE AS THE ACTIVE AGENTS

Louis Cohen, Yonkers, N.Y., assignor to Delco Chemical Company, Inc., Mount Vernon, N.Y.

Continuation-in-part of Ser. No. 481,671, June 21, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,526
Int. Cl.[2] A61K *9/52;, 9/54, 31/135*
U.S. Cl. 424—20 **11 Claims**

1. The composition in which each dosage unit consists of, per 5 mg of active agent, a synergistic combination of:

d,l-amphetamine adipate	1.25 mg
dextroamphetamine adipate	1.25 mg
amphetamine sulfate	1.25 mg
dextroamphetamine sulfate	1.25 mg.

4,049,792

ANTIPERSPIRANT STICK

Walter Hugh Elsnau, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 373,820, June 26, 1973, abandoned. This application Nov. 14, 1975, Ser. No. 632,128
Int. Cl.[2] A61K *7/34*
U.S. Cl. 424—66 **7 Claims**

1. A stick antiperspirant composition essentially anhydrous and comprising essentially water-insoluble materials and a water-soluble antiperspirant salt, said composition comprising

A. from about 1% to about 20% of a high melting point water-insoluble wax which has a melting point of from about 150° F. to about 215° F and which is selected from the group consisting of beeswax, spermaceti, carnauba, bayberry, candelilla, montan, ozokerite, ceresin, paraffin, synthetic wax and microcrystalline wax;

B. from about 20% to about 50% of a liquid, non-toxic, non-irritating organic emollient compound having a water-solubility of from about 0.0005% to about 1% at 72° F.; and

C. from about 30% to about 60% of a compound having antiperspirant activity selected from the group consisting of

i. aluminium chlorhydroxide,

ii. aluminium hydroxybromide,

iii. mixtures of aluminum chlorhydroxide and aluminium chloride, and

iv. antiperspirant complexes formed by

a. co-dissolving in water

1. one part $Al_2(OH)_{6-m}X_m$, wherein X is an anion selected from the group consisting of chloride, bromide and iodide and m is a number from about 0.8 to about 1.2;

2. n parts ZrY wherein Y is an anion selected from the group consisting of —O(OH)Cl and OCl_2, and where n has a value of from about 0.16 to about 1.2;

3. p parts neutral amino acid selected from the group consisting of glycine, dl-tryptophane, dl-β-phenylalanine, dl-valine, dl-methionine and β-alanine, and where p has a value of from about 0.06 to about 0.53; and

b. co-drying the resultant mixture at a temperature of from about 100° C. to about 230° C. to a moisture level of from about 0.5% to about 15% by weight, said compound being in impalpable powder form.

4,049,793

PREPARATIONS FOR LOCAL TREATMENT OF ACNE VULGARIS

Helmut Stickl, Starenweg 6, 8033 Krailling, near Munich, Germany

Filed Mar. 10, 1976, Ser. No. 665,717
Claims priority, application Germany, Mar. 14, 1975, 2511258
Int. Cl.[2] A61K *35/00, 39/40, 39/00, 39/02*
U.S. Cl. 424—115 **11 Claims**

1. A preparation for the local treatment of acne vulgaris comprising, in combination with a suitable vehicle, about 20-40% by weight of an active substance obtained by:

a. growing Coryne bacteria acnes in a liquid growth medium under anaerobic conditions at pH 5.5 to 6.0 with incubation at 35° C for up to 9–16 days until the multiplication peak has passed,

b. separating acne inhibitor acnecine discharged by the growth of said bacteria into said growth medium as an acnecine-containing liquid from said bacteria and other accompanying substances in said growth medium, and

c. concentrating said acnecine-containing liquid into an acnecine concentrate comprising said active substance.

4,049,794

TREATMENT OF INFECTIONS IN ANIMALS

Otto-Christian Straub, Tuebingen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 482,619, June 24, 1974, which is a division of Ser. No. 313,245, Dec. 8, 1972, abandoned. This application Mar. 5, 1976, Ser. No. 664,070
Int. Cl.[2] A61K *31/00, 45/02, 39/28*
U.S. Cl. 424—167 **5 Claims**

1. A method for prophylaxis and treatment of respiratory and genital infections in animals which comprises administer-

ing to the animals an attenuated virus capable of stimulating the natural defense mechanism of a host animal with a detectable non-specific induction of interferon without antigenic effect, wherein said attenuated virus is produced by passing a virus through a plurality of at least 300 tissue cultures to achieve a degree of attenuation such that antigenic effect cannot be detected in the presence of a detectable non-specific induction of interferon in said host animal, and wherein said virus is AUJESZKY/psuedo-rabies virus, AUJESZKY/psueudo-rabies virus—strain S/T, Influenza virus Al, Influenza virus Al—strain FM1 or IPV virus.

4,049,795

TREATMENT OF HEMORRHAGIC SHOCK

Henri Laborit, Paris, France, assignor to Centre d'Etudes Experimentales et Cliniques de Physio Biologie de Pharmacologie et d'Eutonologie, Paris, France

Continuation-in-part of Ser. No. 143,568, May 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 19,532, March 18, 1970, abandoned, which is a continuation of Ser. No. 670,186, Sept. 25, 1967, abandoned. This application May 13, 1974, Ser. No. 469,315

Int. Cl.[2] A61K *31/70, 31/12*

U.S. Cl. 424—180 9 Claims

1. A method of treating shock in humans to reverse the same and elevate blood pressure which comprises intravenously administering to a patient in need thereof a therapeutically effective amount of a pharmaceutically acceptable injectable solution containing from about 200 to 1600 mg of dihydroxyacetone per 100 cc of a pharmaceutically acceptable hypertonic glucose solutions diluent.

4,049,796

AMINO GLYCOSIDE ANTIBIOTICS HAVING ANTIBACTERIAL ACTIVITY

David J. Cooper, Downingtown, Pa.; Jay Allan Waitz, Fairfield, N.J.; Mae Counelis, New York, N.Y., and Jay Weinstein, Bloomfield, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 389,774, Aug. 20, 1973, Pat. No. 3,915,955, which is a continuation-in-part of Ser. No. 48,017, June 22, 1970, abandoned. This application Oct. 1, 1975, Ser. No. 618,647

Int. Cl.[2] A61K *31/70*

U.S. Cl. 424—180 5 Claims

1. A method of treating a bacterial infection which comprises administering to an animal having said infection an antibacterially effective quantity of a member selected from the group consisting of gentamicin B, gentamicin B_1, gentamicin X, a non-toxic pharmaceutically acceptable acid addition salt, and a mixture thereof.

4,049,797

COMPOSITION AND METHOD FOR TREATMENT OF HEART AND CIRCULATORY AILMENTS

Knut A. Jaeggi, Basel; Herbert Schröter, Fullinsdorf, and Franz Ostermayer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

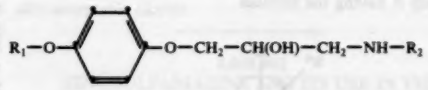
Division of Ser. No. 546,648, Feb. 3, 1975, Pat. No. 3,978,041, which is a continuation-in-part of Ser. No. 421,558, Dec. 4, 1973, abandoned. This application Mar. 22, 1976, Ser. No. 669,078

Int. Cl.[2] A61K *31/70*

U.S. Cl. 424—180 4 Claims

1. A pharmaceutical composition useful as positively inotropic agent in the treatment of insufficiency of the cardiac muscle, comprising a corresponding therapeutically effective amount of a sugar compound of the formula I

(I)



wherein R_1 represents 1-glucopyranosidyl, 2,3,4,6-tetra-O-alkanoylated 1-glucopyranosidyl, the alkanoyl radical of which having up to four carbon atoms, or 2,4-O,O-alkylidene substituted 1-glucopyranosidyl, the alkylidene radical of which having up to four carbon atoms, or 2,4-O-benzylidene substituted 1-glucopyranosidyl, R_2 is isopropyl, tert.-butyl, α-methyl-phenethyl or 1-methyl-3-phenyl-propyl, or a pharmaceutically acceptable salt thereof, together with a pharmaceutically usable excipient.

4,049,798

METHOD FOR THE TREATMENT OF HERPES SIMPLEX

William K. Bottomley, Potomac, Md., assignor to William K. Bottomley, Potomac, Md.; O. J. Brightwell, Sacramento, Calif. and Thomas J. Newell, III, Bethesda, Md.

Continuation of Ser. No. 531,459, Dec. 11, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,742

Int. Cl.[2] A61K *35/78, 31/365*

U.S. Cl. 424—195 7 Claims

1. A method for the treatment of recurrent herpes simplex labialis which comprises administering to a patient suffering therefrom a therapeutically effective amount of a mixture comprising (a) about 50 weight percent L-ascorbic acid and (b) about 50 weight percent citrus bio-flavonoids.

4,049,799

METHOD, COMPOSITION AND COMPOUNDS FOR TREATING EXCESS PROSTAGLANDINS

Bertil Högberg; Hans Fex; Toirsten Perklev; Sten Veige, all of Helsingborg, and Bo Fredholm, Nyhamnslage, all of Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

Division of Ser. No. 519,542, Oct. 31, 1974, which is a division of Ser. No. 280,276, Aug. 14, 1972, Pat. No. 3,851,019. This application Aug. 20, 1976, Ser. No. 716,198

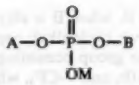
Claims priority, application United Kingdom, Aug. 17, 1971, 38579/71; Aug. 17, 1971, 38580/71; Jan. 31, 1972, 4508/72; Jan. 31, 1972, 4509/72

Int. Cl.[2] C07F *9/09;* A01N *9/36*

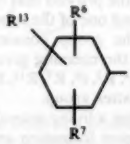
U.S. Cl. 424—211 15 Claims

1. A novel secondary phosphoric acid ester compound having the general formula

(I)

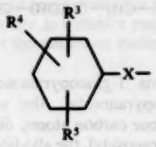


wherein M is selected from the group consisting of hydrogen; and a pharmaceutically acceptable inorganic and organic cations; and wherein A is



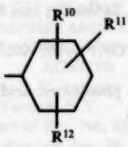
wherein one and only one of the substituents R^6, R^7, and R^{13} always represents a group R, located in any of the ortho, meta

and para positions relative to the phosphoric acid ester group, the group R having the formula



wherein X is selected from the group consisting of:

wherein *q* is selected from the group consisting of zero and one; and wherein Z is selected from the group consisting of: straight saturated hydrocarbon chains having at most 3 carbon atoms; and straight hydrocarbon chains having 2 and 3 carbon atoms and containing one double bond; Z above may be substituted by one substituent selected from the group consisting of: lower alkyl; lower alkenyl; cyclopentyl; cyclohexyl; phenyl; phenyl substituted in m- or p-position by one substituent selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; benzyl; benzyl substituted in m- or p-position by one substituent selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; benzylidene; benzylidene substituted in m- or p-position by one substituent selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; wherein B in the general formula (I) above is selected from the group consisting of: alkyl; having one to eight carbon atoms, inclusive, being at most di-substituted; cycloalkyl, namely cyclopentyl and cyclohexyl, being at most di-substituted; 1- and 2-naphthyl, both naphthyls being at most di-substituted; 2-, 3- and 4-biphenylyl, any biphenylyl being at most di-substituted; and



wherein the substituents in B, when B is alkyl, having one to eight carbon atoms, inclusive; cycloalkyl; naphthyl; or biphenylyl, are selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; wherein R^3, R^4, R^5, R^6, R^7, R^{10}, R^{11}, R^{12}, and R^{13} above are selected from the group consisting of: hydrogen; lower alkyl; lower alkenyl; lower alkoxy; hydroxy; —O—CO—R^{14}; —F; —Cl; —Br; —CF_3; —CO—R^{14}; -NR_2^8; and —$CH_2NH_2^8$; where R^8 is selected from the group consisting of hydrogen and lower alkyl; and where R^{14} is lower alkyl, with the proviso that one of the substituents R^3, R^4, R^5, R^6, R^7, R^{13} and one of the substituents R^{10}, R^{11}, and R^{12} is selected from the group consisting of —NR_2^8, and —$CH_2NR_2^8$; R^8 having the meaning given above; at least one of the substituents R^3, R^4, R^5, r^6, R^7, R^{13}, R^{10}, R^{11}, and R^{12} being selected from the said latter group.

2. A method of treating a living animal body suffering from the actions of an excessive formation and release of endogenous prostaglandin or exposure to exogenous prostaglandin, comprising administration of a therapeutically-effective amount of a compound of claim **1** to said animal body.

4,049,800

METHOD, COMPOSITION AND COMPOUNDS FOR TREATING EXCESS PROSTAGLANDINS

Bertil Högberg; Hans Fex; Torsten Perklev; Sten Veige, all of Helsingborg, and Bo Fredholm, Nyhamnslage, all of Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

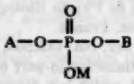
Division of Ser. No. 519,542, Oct. 31, 1974, which is a division of Ser. No. 280,276, Aug. 14, 1972, Pat. No. 3,851,019. This application Aug. 20, 1976, Ser. No. 716,197

Claims priority, application United Kingdom, Aug. 17, 1971, 38579/71; Aug. 17, 1971, 38580/71; Jan. 31, 1972, 4508/72; Jan. 31, 1972, 4509/72

Int. Cl.[2] **C07F** *9/09;* **A01N** *9/36*

U.S. Cl. 424—211 **16 Claims**

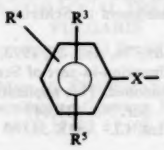
1. A novel secondary phosphoric acid ester compound having the general formula



(I)

wherein M is selected from the group consisting of hydrogen; and a pharmaceutically acceptable inorganic and organic cations; and wherein A is

wherein one and only one of the substituents R^6, R^7, and R^{13} always represents a group R, located in any of the ortho, meta and para positions relative to the phosphoric acid ester group, the group R having the formula



wherein X is selected from the group consisting of:

wherein *q* is selected from the group consisting of zero and one; and wherein Z is selected from the group consisting of: straight saturated hydrocarbon chains having at most 3 carbon atoms; and straight hydrocarbon chains having 2 and 3 carbon atoms and containing one double bond; Z above may be substituted by one substituent selected from the group consisting of: lower alkyl; lower alkenyl; cyclopentyl; cyclohexyl; phenyl; phenyl substituted in m- or p-position by one substituent selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; benzyl; benzyl substituted in m- or p-position by one substituent selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; benzylidene; benzylidene substituted in m- or p-position by one

substituent selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; wherein B in the general formula (I) above is selected from the group consisting of: alkyl; having one to eight carbon atoms, inclusive, being at most di-substituted; cycloalkyl, namely cyclopentyl and cyclohexyl, being at most di-substituted; 1- and 2-naphthyl, both naphthyls being at most di-substituted; 2-, 3- and 4-biphenylyl, any biphenylyl being at most di-substituted; and

wherein the substituents in B, when B is alkyl, having one to eight carbon atoms, inclusive; cycloalkyl; naphthyl; or biphenylyl, are selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; wherein R^3, R^4, R^5, R^6, R^7, R^{10}, R^{11}, R^{12}, and R^{13} above are selected from the group consisting of: hydrogen; lower alkyl; lower alkenyl; lower alkoxy; hydroxy; —O—CO—R^{14}; —F; —Cl; —Br; —CF_3; —CO—R^{14}; —$CONR_2^8$; —$CH_2CONR_2^8$; —$OCH_2CONR_2^8$; —NR^8—CO—R^{14}; and —CH_2NR^8—CO—R^{14}; where R^8 is selected from the group consisting of hydrogen and lower alkyl; and where R^{14} is lower alkyl, with the proviso that one of the substituents R^3, R^4, R^5, R^6, R^7, R^{13} and one of the substituents R^{10}, R^{11}, and R^{12} is selected from the group consisting of —$CONR_2^8$; —$CH_2CONR_2^8$; —$OCH_2CONR_2^8$; —NR^8—CO—R^{14}; and —CH_2NR^8—CO—R^{14}; R^8, and R^{14} having the meaning given above; at least one of the substituents R^3, R^4, R^5, R^6, R^7, R^{13}, R^{10}, R^{11}, and R^{12} being selected from the said latter group.

2. A method of treating a living animal body suffering from the actions of an excessive formation and release of endogenous prostaglandin or exposure to exogenous prostaglandin, comprising administration of a therapeutically-effective amount of a compound of claim 1 to said animal body.

4,049,801

PHOSPHITE COMPOUNDS AS FUNGICIDAL AGENTS

Jean-Claude Debourge, Lyon; Jean-Michel Gaulliard, Orlienas; Jean Pierre Thiolliere, Lyon; Jean Georges Abblard, Caluire; Guy-Bernard Lacroix, Lyon; Daniel Jean Pillon, Lyon; Jacques Joseph Ducret, Lyon, and Andre Thizy, Lyon, all of France, assignors to Philagro, France

Division of Ser. No. 432,492, Jan. 11, 1974, Pat. No. 3,968,208. This application Sept. 16, 1975, Ser. No. 613,877

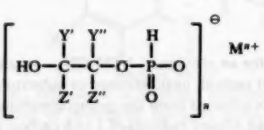
Claims priority, application France, Jan. 12, 1973, 73.01803; Oct. 19, 1973, 73.37994

Int. Cl.² A01N *9/36*

U.S. Cl. 424—217 **10 Claims**

1. A fungicidal composition for controlling fungus disease in plants containing a fungicidally effective amount of at least one compound corresponding to the formula;

(II)



in which Y', Y'', Z' and Z'' are the same or different and are selected from the group consisting of hydrogen, alkyl of from 1 to 5 carbon atoms an halogenated alkyl of from 1 to 5 carbon atoms; and M is selected from the group consisting of hydrogen, alkali, alkaline earth metal, iron, copper, zinc, manganese, nickel, cobalt, mercury, ammonium, ethanolammonium, dimethylammonium; diethylammonium and diisopropylammonium; and n is an integer equal to the valency of M; in an agriculturally acceptable carrier.

4,049,802

ZINC SULFADIAZINE AND ITS USE IN THE TREATMENT OF BURNS

Charles L. Fox, Jr., New York, N.Y., assignor to Research Corporation, New York, N.Y.

Filed Mar. 19, 1975, Ser. No. 560,103

Int. Cl.² A61K *31/625*; C07D *239/44*

U.S. Cl. 424—229 **18 Claims**

1. A composition useful for treating burns consisting essentially of an admixture of silver sulfadiazine and zinc sulfadiazine dispersed as finely divided particles in a water-dispersible hydrophilic carrier, said admixture being present in said composition in an amount to about 10% by weight of said composition and said silver sulfadiazine and said zinc sulfadiazine being present in said composition in an amount of at least 0.1% by weight and 1.0% by weight, respectively, based on said composition.

18. Zinc sulfadiazine.

4,049,803

AUGMENTATION OF BLOOD LEVELS OF ASPIRIN

Val F. Cotty, Westfield; Francis J. Sterbenz, Somerset, and Kenneth J. Melman, Mountainside, all of N.J., assignors to Bristol-Myers Company, New York, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,307

Int. Cl.² A61K *31/615*

U.S. Cl. 424—233 **13 Claims**

1. As a composition of matter, a dose of a mixture containing about 10 grains of acetaminophen and about 10 grains of acetylsalicylic acid, said dose being in the form of a powder, solution, slurry or one or more tablets and being adapted for substantially concurrent release of both of said acetaminophen and said acetylsalicylic acid to the body.

4,049,804

NOVEL PREGNANOIC ACID DERIVATIVES

Henry Laurent; Klaus Annen; Rudolf Wiechert, and Helmut Hofmeister, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

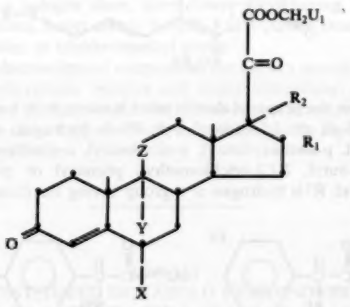
Filed Mar. 19, 1976, Ser. No. 668,394

Claims priority, application Germany, Mar. 21, 1975, 2513558; Mar. 21, 1975, 2513555; Mar. 21, 1975, 2513557; Mar. 21, 1975, 2513556

Int. Cl.² A61K *31/56*; C07J *21/00*

U.S. Cl. 424—242 **81 Claims**

1. A pregnanoic acid compound of the formula



wherein – – – is a single bond or a double bond; X is hydrogen, fluorine or methyl; Y is hydrogen, fluorine or chlorine; Z is β-hydroxymethylene, β-alkanoyloxymethylene of 1–8 carbon atoms in the alkanoyl, β-fluoromethylene, β-chloromethylene, carbonyl or methylene; R_1 is hydrogen, methyl in the α- or

β-position or methylene and R_2 is hydrogen, hydroxy, alkanoyloxy of 1–8 carbon atoms or benzoyloxy or R_1 and R_2 collectively are alkylidenedioxy of up to 6 carbon atoms; and U_1 is halogen, halogenated alkyl of 1–5 carbon atoms or halogenated phenyl with the provision that when R_2 is hydrogen, U_1 is halogenated phenyl.

71. A topically-effective anti-inflammatory pharmaceutical preparation comprising a compound of claim **1**, in admixture with a pharmaceutically acceptable carrier.

4,049,805

STEROIDAL ERYTHROPOIETIC AGENTS AND THERAPEUTIC COMPOSITIONS AND METHODS

Henry A. Strade, Montville, N.J., assignor to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 618,176, Sept. 30, 1975, Pat. No. 4,004,005. This application June 4, 1976, Ser. No. 693,249
The portion of the term of this patent subsequent to Jan. 18, 1994, has been disclaimed.
Int. Cl.[2] A61K *31/565*
U.S. Cl. 424—243 **7 Claims**

1. Method for the stimulation of erythropoiesis in humans and other warm-blooded animals in need of such therapy which acomprises administering an amount effective to produce such stimulation of a compound selected from the group consisting of 3β-hydroxy-5β-estrane-17-one, and the 3-esters thereof of inorganic acids and of organic carboxylic acids having 3 to 18 carbon atoms, and the 3-ethers thereof in which the ether group is selected from the group consisting of methoxy, ethoxy, propoxy, benzyloxy and phenylethoxy.

4,049,806

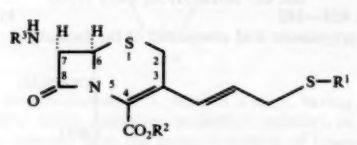
CEPHALOSPORIN TYPE ANTIBACTERIALS

Philip J. Beeby, Melbourne, Australia, assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Aug. 15, 1975, Ser. No. 605,109
Int. Cl.[2] C07D *501/24*
U.S. Cl. 424—246 **39 Claims**

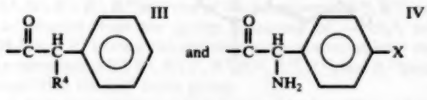
1. A compound selected from the group having the formula:

I



wherein the propenyl double bond is trans; R^1 is 1-methyltetrazol-5-yl; or 1,2,4-triazol-5-yl; R^2 is hydrogen, diphenylmethyl, p-methoxybenzyl, p-nitrobenzyl, o-nitrobenzyl, benzyl, t-butyl, 2,2,2,-trichloroethyl, phenacyl or pivaloyloxymethyl; R^3 is hydrogen or a group having the formulas:

III and IV



wherein R^4 is hydrogen, hydroxy, sulfo or carboxy; X is hydrogen or hydroxy; and pharmaceutically acceptable salts of the above compounds wherein R^3 is other than H.

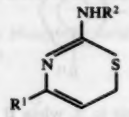
4,049,807

2-AMINO-1,3-THIAZINES THEIR USE AND PREPARATION

Wilfried Paulus, Krefeld; Hans Scheinpflug, Leverkusen, and Hermann Genth, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 28, 1975, Ser. No. 581,526
Claims priority, application Germany, June 1, 1974, 2426653
Int. Cl.[2] C07D *279/06;* **A01N** *9/12*
U.S. Cl. 424—246 **33 Claims**

1. A 2-amino-1,3-thiazine of the formula



wherein

R^1 is optionally substituted phenyl, naphthyl, thienyl, pyridyl or thiazolyl, and

R^2 is hydrogen, alkyl or alkenyl with up to 18 carbon atoms, or optionally substituted phenyl, naphthyl, thienyl, pyridyl or thiazolyl,

the optional substituents for R^1 and R^2 constituting up to three radicals selected from the group consisting of halogen, nitro hydroxy, or alkyl, halogeno-alkyl or alkoxy with up to 12 carbon atoms.

21. A method for combatting fungi or bacteria which comprises applying to such fungi, bacteria or a habitat thereof a fungicidally or bactericidally effective amount of a thiazine according to claim **1**.

4,049,808

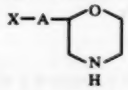
2-PHENYL ETHYL MORPHOLINE COMPOUNDS

Bernard Joseph McLoughlin, and Allen John Guildford, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 567,011, April 10, 1975, Pat. No. 4,010,266. This application Oct. 22, 1976, Ser. No. 735,124
Claims priority, application United Kingdom, May 7, 1974, 20013/74
Int. Cl.[2] C07D *265/30;* **A61K** *31/535*
U.S. Cl. 424—248.4 **8 Claims**

1. A morpholine derivative of the formula:

I



wherein A stands for an ethylene ($-CH_2CH_2-$) radical and X stands for a phenyl radical, unsubstituted or substituted by one or two substituents selected from the group consisting of halogen atoms, alkyl and alkoxy radicals of 1 to 6 carbon atoms and phenoxy, unsubstituted or substituted by one or two substituents selected from halogen atoms and alkyl radicals of 1 to 4 carbon atoms; and the pharmaceutically-acceptable acid-addition salts thereof.

8. A method of restoring to normal an abnormal mental state in a warm-blooded animal by sedation which comprises administering thereto an effective amount of a compound of claim **1**.

4,049,809

SOLUTION OF A OXAZEPINE FOR ORAL OR PARENTERAL ADMINISTRATION

Bruce Edwin Haeger, Highland Mills; James Elwood Krueger; James Alfred Lowery, both of New City, and Lawrence Ritter, Suffern, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 24, 1976, Ser. No. 734,682
Int. Cl.[2] A61K *31/495*
U.S. Cl. 424—250 8 Claims

1. A solubilized and stabilized solution comprising 2-chloro-11-(4-methyl-1-piperazinyl)-dibenz[b,f][1,4]oxazepine, or a pharmaceutically acceptable acid-addition salt thereof, in about 50% to about 80% v/v aqueous solution of propylene glycol having a pH of from about 5.0 to about 7.0.

4,049,810

COCCIDIOSTATS

Herbert Louis Wehrmeister, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Division of Ser. No. 602,602, Aug. 6, 1975, Pat. No. 4,006,148. This application May 24, 1976, Ser. No. 689,401
Int. Cl.[2] A61K *31/47*
U.S. Cl. 424—258 12 Claims

1. A method for preventing and/or treating coccidiosis in poultry by administering to the poultry at a concentration of 200 g/ton of feed, 2,5-dichloroquinoline or 2,7-dichloro-3-phenylquinoline.

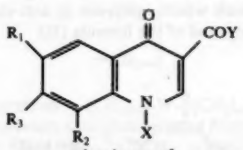
4,049,811

COMPOSITIONS USING CYCLOALKANO-QUINOLONE DERIVATIVES AND THEIR METHOD OF USE

Herbert Berger, Mannheim-Kafertal; Alfred Rhomberg, Mannheim-Neuostheim; Kurt Stach, Mannheim-Waldhof; Wolfgang Vomel, Mannheim, and Winfriede Sauer, Mannheim-Wallstadt, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Division of Ser. No. 504,589, Sept. 9, 1974, Pat. No. 3,966,743, which is a continuation-in-part of Ser. No. 363,211, May 23, 1973, abandoned, Ser. No. 363,235, May 23, 1973, abandoned, and Ser. No. 326,203, Jan. 24, 1973, abandoned, said Ser. No. 363,211, is a continuation of Ser. No. 98,957, Dec. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 843,182, July 18, 1969, abandoned, said Ser. No. 363,235, is a continuation of Ser. No. 119,035, Feb. 25, 1971, abandoned. This application Apr. 12, 1976, Ser. No. 676,269
Claims priority, application Germany, July 23, 1968, 1770951; Mar. 14, 1969, 1912944; Mar. 13, 1970, 2011885; May 25, 1970, 2025363; Sept. 4, 1970, 2043817; Feb. 19, 1972, 2207856
Int. Cl.[2] A61K *31/47*
U.S. Cl. 424—258 39 Claims

1. An anit-bacterial composition comprising a pharmacologically acceptable carrier and, as an active anti-bacterial ingredient, a cycloalkano-quinolone compound having the formula:



wherein one of

R_1 and R_2 represents a member selected from the group consisting of hydrogen, halogen, nitro, amino and lower alkanoyl amino, and the other of R_1 and R_2 taken together with R_3 forms an alkylene bridge containing 3 to 5 carbon atoms,

X is hydrogen or lower alkyl of up to 6 carbon atoms, which may be substituted by a member of the group consisting of halogen, hydroxyl, lower alkanoyloxy, lower alkoxy, phenoxy, benzyloxy, mercapto, lower alkylmercapto, lower carbocyclic arylsulfonyloxy, and lower alkylsulfonyloxy, or X is unsubstituted lower alkenyl including alkadienyl, or lower alkynyl, and

Y is a member selected from the group consisting of hydroxyl and lower alkoxy;

and the non-toxic salts thereof.

4. A method for treating infections of the urinary tract comprising administering to a mammal having such an infection a anti-bacterially effective amount of a composition as claimed in claim 1.

4,049,812

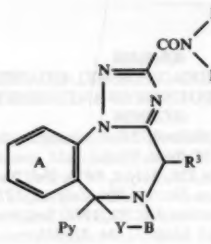
BENZODIAZEPINE CARBOXAMIDES AND PHARMACEUTICAL COMPOSITIONS WITH CENTRAL NERVOUS SYSTEM ACTIVITY

Yutaka Kuwada; Hideaki Natsugari, and Kanji Meguro, all of Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 30, 1975, Ser. No. 572,943
Claims priority, application Japan, May 7, 1974, 49-51033
Int. Cl.[2] A61K *31/44;* C07D *223/16*
U.S. Cl. 424—263 21 Claims

1. A compound of the formula (I):

(I)



wherein each R^1 and R^2 represents a hydrogen atom, or an alkyl group having form 1 to 6 carbon atoms, said alkyl group being unsubstituted or substituted by a C_{1-4} alkylamino, hydroxy or C_{1-4} alkoxy group, or R^1 and R^2 together with the nitrogen atom adjacent thereto forming piperidino or pyrrolidino; R^3 represents a hydrogen atom or a lower alkyl group having 1 to 4 carbon atoms; Py represents a pyridyl group; B represents an ethylene group or ethylene which is substituted by lower alkyl having 1 to 4 carbon atoms; Y represents an oxygen atom; and the ring A is either unsubstituted or substituted by a halogen atom, nitro, lower alkyl having 1 to 4 carbon atoms, lower alkoxy having 1 to 4 carbon atoms, trifluoromethy, or trichloromethyl group.

21. A pharmaceutical composition for use as a muscle relaxant, anticonvulsant, sedative and minor tranquilizer, which comprises a therapeutically effective amount of a compound as claimed in claim 1 together with a pharmaceutically acceptable carrier or diluent.

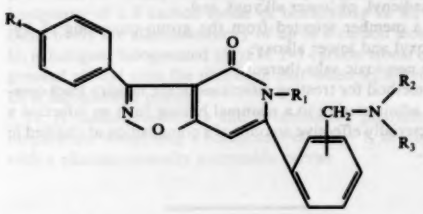
4,049,813

SUBSTITUTED ISOXAZOLO PYRIDINONES

Jeffrey Nadelson, Denville, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed July 15, 1976, Ser. No. 705,702
Int. Cl.[2] A61K *31/415;* C07D *491/04*
U.S. Cl. 424—263 7 Claims

1. A compound of the formula



where

R_1 represents straight chain lower alkyl, and

R_2 and R_3 each independently represent hydrogen or lower alkyl, and

R_4 is hydrogen, halo having an atomic weight of about 19 to 36, or lower alkoxy,

or a pharmaceutically acceptable salt thereof.

5. A pharmaceutical composition comprising a hypolipidemically effective amount of a compound of claim **1** and a pharmaceutically acceptable carrier therefor.

4,049,814

SUBSTITUTED PHENOXYALKYL QUATERNARY AMMONIUM COMPOUNDS AS ANTIARRHYTHEMIC AGENTS

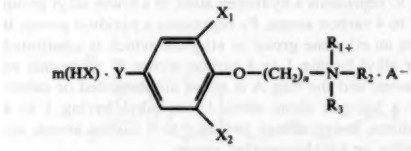
Stanley J. Strycker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 484,525, July 1, 1974, Pat. No. 3,932,664, which is a division of Ser. No. 164,086, July 19, 1971, Pat. No. 3,875,215. This application Jan. 12, 1976, Ser. No. 648,535

Int. Cl.[2] A61K *31/44, 31/445*

U.S. Cl. 424—267 **8 Claims**

5. A method for combatting cardiac arrhythmias which comprises administering to an animal a cardiac antiarrhythmic amount of a quaternary ammonium compound corresponding to the formula



wherein Y represents amino, loweralkylamino or dioweralkylamino; R_1 and R_2 taken together represent an aliphatic hydrocarbon moiety of 5 carbon atoms substituted with zero, one or two lower alkyl substituents; R_3 independently is selected from the group consisting of lower alkenyl, phenacyl, mono-, di-, or trihalophenacyl, lower alkynyl, substituted lower alkyl, substituted lower alkenyl and substituted lower alkynyl substituted with a substituent selected from the group consisting of halogen, phenyl, halophenyl, dihalophenyl, trihalophenyl, nitrilo and hydroxy [and carboxyalkyl and keto; R_1, R_2 and R_3 independently taken together represent a quinuclidine, pyridine, picoline or lutidine residue]; X_1 and X_2 both represent halogen; A^- represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable anion; n represents one of the integers 2, 3 or 4; HX represents stochiometric equivalent quantity of a pharmaceutically-acceptable acid; and *m* represents one of the integers zero and one.

4,049,815

TRIAZOLES

John James Alexander Evans, East Brighton, and George Holan, Brighton, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Continuation-in-part of Ser. No. 522,626, Nov. 11, 1974. This application Oct. 6, 1975, Ser. No. 620,185

Claims priority, application Australia, Nov. 30, 1973, 5638/73; United Kingdom, Nov. 11, 1974, 48784/74

Int. Cl.[2] A61K *31/41;* **C07D** *249/08*

U.S. Cl. 424—269 **3 Claims**

1. A triazole of the formula I,

I

wherein R^1 is a phenyl group substituted with two or more trihalomethyl groups; and R^2 is H.

4,049,816

ANTIVIRAL 2-AMINO-5-[1-(INDOL-3-YL)ALKYL]-2-THIAZOLIN-4-ONES

Michael Raymond Harnden, Horsham, and Nicholas David Wright, Westcott, near Dorking, both of England, assignors to Beecham Group Limited, England

Filed Mar. 15, 1976, Ser. No. 666,662

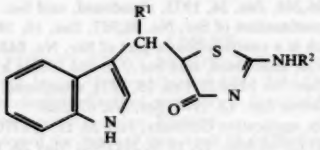
Claims priority, application United Kingdom, Mar. 24, 1975, 12147/75

Int. Cl.[2] C07D *275/02*

U.S. Cl. 424—270 **24 Claims**

1. A compound of the formula (II):

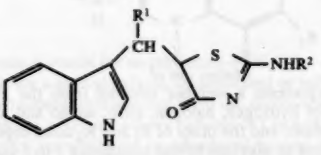
(II)



or a tautomer thereof wherein R^1 is hydrogen or methyl and R^2 is hydrogen, alkyl of 1 to 4 carbon atoms, or benzyl unsubstituted or substituted by one or two halogen atoms, methoxy or nitro groups.

12. A pharmaceutical composition useful for combatting infections caused by an RNA virus in the respiratory system of humans and animals which comprises an anti-virally effective amount of a compound of the formula (II):

(II)



or a tautomer thereof wherein R^1 is hydrogen or methyl and R^2 is hydrogen, alkyl of 1 to 4 carbon atoms, or benzyl unsubstituted or substituted by one or two halogen atoms, methoxy or nitro groups, in combination with a pharmaceutically acceptable carrier.

4,049,817

SYNERGISTIC COMPOSITIONS

Georg Laber, and Eberhard Schutze, both of Vienna, Austria, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 547,546, Feb. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 386,847, Aug. 8, 1973, abandoned. This application Apr. 7, 1976, Ser. No. 674,387

Claims priority, application Switzerland, Aug. 14, 1972, 12008/72

Int. Cl.[2] A61K *31/425*

U.S. Cl. 424—270 4 Claims

1. A pharmaceutical composition which comprises 6-chlorobenzisothiazolinone in free base or pharmaceutically acceptable acid addition salt form and 3-[(5-nitrofurfurylidene)amino]-2-oxazolidinone in free base or pharmaceutically acceptable acid addition salt form as the active ingredients, the 6-chlorobenzisothiazolinone being present in an amount of from 20 to 80%, and the 3-[(5-nitrofurfuryliden)amino]-2-oxazolidinone in an amount of from 80 to 20% based on the total weight of active ingredients.

4,049,818

3-CHLORO-1,3-OXAZINES OR OXAZOLIDINES AS ANTIBACTERIAL AGENTS

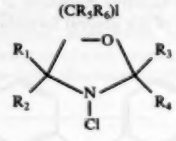
Nicolae S. Bodor, and James J. Kaminski, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Division of Ser. No. 566,747, April 10, 1975, Pat. No. 3,954,985, which is a division of Ser. No. 456,744, April 1, 1974, Pat. No. 3,897,425. This application Feb. 3, 1976, Ser. No. 654,870

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—272 5 Claims

1. A method for inhibiting bacterial growth which comprises treating said bacterial growth with an antibacterially effective amount of a compound of the formula:



wherein each of R_1 and R_2 which may be the same of different represents an alkyl group of from 1 to 20 carbon atoms; wherein each of R_5 and R6 which may be the same or different, represents a hydrogen atom or alkyl of from 1 to 20 carbon atoms; and wherein each of R_3 and R_4 which may be the same or different represent

wherein Y represents $—(CH_2)_n—W—(CH_2)_m—$ or $>CH\text{-}Z$, wherein W represents a member selected from the group consisting of —O—, $—CH_2—$, $>NCH_3$, $>NHCH_3^+$, $>NC_2H_5$, $>NHC_2H_5^+$, $>N(CH_3)_2^+$, and $>N(C_2H_5)_2^+$, wherein *n* is the same of different from *m* and wherein each of *n* and *m* represent an integer of from 0 to 2 and wherein Z represents a member selected from the group consisting of dimethylamino, diethylamino, trimethylammonium, triethylammonium, dimethylammonium, diethylammonium, $—COOR_7$, $—OOCR_8$ and $—OR_9$, wherein each of R_7 through R_9 respectively, represent a member selected from the group consisting of alkyl of from 1 to 5 carbon atoms and benzyl; and wherein *l* represents an integer of 1 or 2.

4,049,819

METHOD OF COMBATTING MICROORGANISMS EMPLOYING SUBSTITUTED OXAZOLINES

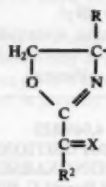
Jerry H. Hunsucker, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Feb. 9, 1976, Ser. No. 656,486

Int. Cl.[2] A01N *9/22, 9/28*

U.S. Cl. 424—272 9 Claims

1. A method of combatting bacteria and fungi by applying in an amount lethal to said bacteria and fungi and to the environment inhabitated by them, an oxazoline represented by the formula



where R and R^1 are hydrogen, methyl, or hydroxymethyl and can be the same or different, R^2 is an alkyl group of from 4 to 16 carbon atoms and X is H_2 or $(—CH_2OH)_2$.

4,049,820

SUBSTITUTED URAZOLE AND THIOURAZOLE COMPOUNDS AS AGRICULTURAL FUNGICIDAL AGENTS

Taichiro Shigematsu; Tetsuya Shibahara; Makoto Nakazawa, all of Yokohama; Masayuki Tomida, Sagamihara, and Toshio Munakata, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

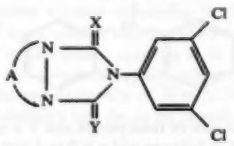
Filed Dec. 8, 1975, Ser. No. 638,761

Claims priority, application Japan, Dec. 13, 1974, 49-143183

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—273 P 9 Claims

1. A method of killing plant pathogenic fungi which comprises applying to said fungi a fungicidally effective amount of a compound represented by the following formula:



wherein each of X and Y represents oxygen or sulfur, and A represents alkylene having 3 carbon atoms which may have branched methyl.

4,049,821

METHOD OF TREATING ALLERGY

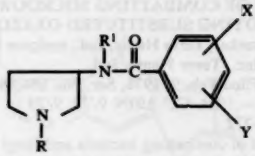
William Henry Funderburk, Jr., Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Filed May 12, 1976, Ser. No. 685,576

Int. Cl.[2] A61K *31/40*

U.S. Cl. 424—274 8 Claims

1. A method for ameliorating and controlling symptoms associated with asthma which comprises internally administering to a living animal body in need thereof an effective amount of an allergy ameliorating benzamide of the formula:



wherein;

R is hydrogen, lower cycloalkyl, phenyllower alkyl or lower alkyl,

R^1 is hydrogen or lower alkyl,

X is hydrogen, nitro, amino, acetamido, diloweralkylamino, hydroxy, lower alkyl or loweralkylsulfonylamino, and

Y is hydrogen, nitro or sulfamoyl.

4,049,822

MICROBIOCIDAL COMPOSITIONS COMPRISING A SOLUTION OF A PHENOXARSINE COMPOUND

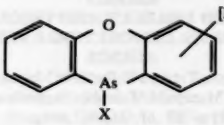
Nuno M. Rei, Peabody, and Ronald C. Wilson, Wenham, both of Mass., assignors to Ventron Corporation, Beverly, Mass.

Filed Aug. 4, 1975, Ser. No. 601,967

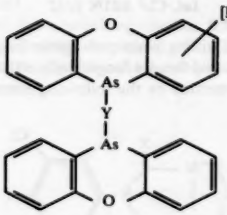
Int. Cl.² A01N *9/00*

U.S. Cl. 424—297 **8 Claims**

1. A microbiocidal composition comprising a solution of above about 20 weight percent of a phenoxarsine compound of the formula selected from the group consisting of



and



wherein X is halogen or thiocyanate and Y is oxygen or sulfur, R is lower alkyl or halogen and *n* is 0 to 3 and mixtures of said compounds and a solvent for the phenoxarsine selected from the group consisting of a glycyl phosphite, glycyl phosphonate and mixtures thereof.

4,049,823

PHENYLBUTANOL DERIVATIVES AND COMPOSITIONS CONTAINING THEM

Erich Schacht; Werner Mehrhof; Albrecht Wild; Joachim Gante, and Hans-Adolf Kurmeier, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

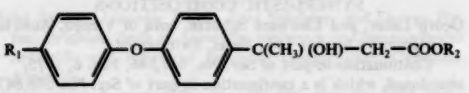
Filed Feb. 25, 1975, Ser. No. 552,959

Claims priority, application Germany, Mar. 1, 1974, 2409761; June 14, 1974, 2428686; July 3, 1974, 2431951; July 26, 1974, 2436012

Int. Cl.² C07C *69/76*

U.S. Cl. 424—308 **12 Claims**

1. A compound of the formula



wherein R_1 is F, Cl or Br and R_2 is H or alkyl of 1 to 6 carbon and their physiologically acceptable salts when R_2 is H.

4,049,824

CETYL MYRISTOLEATE

Harry Weldon Diehl, 4424 Oak Hill Road, Rockville, Md. 20853

Filed May 3, 1976, Ser. No. 682,540

Int. Cl.² A61K *31/23*; C11C *3/02*

U.S. Cl. 424—312 **10 Claims**

1. A method of relieving and inhibiting the symptoms of inflammatory rheumatoid arthritis in mammals which comprises the parenteral administration to a mammal of an effective amount of cetyl myristoleate.

10. The compound, cetyl myristoleate, having the structure

$$CH_3(CH_2)_{13}OCO(CH_2)_7CH{=}CH(CH_2)_5CH_3.$$

4,049,825

AMINOALKYLETHERS; COMPOSITION AND METHOD OF USE

Johan Gootjes, Heerhugowaard, Netherlands, assignor to Gist-Brocades N.V., Netherlands

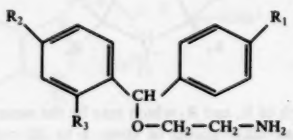
Division of Ser. No. 338,621, March 6, 1973, Pat. No. 4,003,932. This application Oct. 20, 1976, Ser. No. 734,358

Claims priority, application United Kingdom, Mar. 7, 1972, 10543/72

Int. Cl.² C07C *9/20, 9/24*

U.S. Cl. 424—316 **7 Claims**

1. Pharmaceutical compositions for treatment of Parkinsonism which comprise as active ingredient at least one diphenylmethoxyethylamine of the general forumla



in which R_1 represents a fluorine, bromine or chlorine atom, R_2 represents a hydrogen or fluorine atom and R_3 represents a hydrogen, fluorine or chlorine atom, with the proviso that R_3 is a hydrogen atom when R_2 is a fluorine atom and R_1 is a fluorine atom when R_3 is a chlorine atom or a non-toxic acid addition salt thereof, in association with a pharmaceutically acceptable carrier in unit dosage form.

4,049,826

ACARICIDAL AND LEPIDOPTERICIDAL ACTIVE CARBON-IMIDOTHIOATES

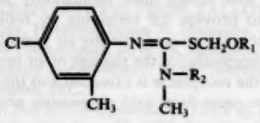
George B. Large, Pinole, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 623,844, Oct. 20, 1975, Pat. No. 3,992,447. This application Aug. 6, 1976, Ser. No. 712,288

Int. Cl.² A01N *9/20*

U.S. Cl. 424—326 **12 Claims**

1. A method of killing or substantially injuring lepidoptera and acarids consisting of applying to the habitate thereof an lepidopterically or acaricidally effective amount of the compound having the formula



4,049,827

METHOD OF TREATING ARRHYTHMIA WITH DIARYLBUTANOLAMINES

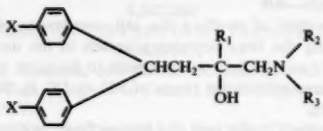
Bryan Barnet Molloy, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 583,819, June 4, 1975, Pat. No. 4,001,328. This application Oct. 12, 1976, Ser. No. 731,156

Int. Cl.[2] A61K *31/135, 31/535, 31/445, 31/14, 31/40*

U.S. Cl. 424—330 8 Claims

1. A method of treating arrhythmia which comprises administering to a subject suffering from an arrhythmia and in need of treated or to a subject suspected of developing an arrhythmia an amount effective for treating the arrhythmia of a compound of the formula



wherein:

X is hydrogen or fluorine;

R_1 is hydrogen or C_1–C_3 alkyl;

R_2 and R_3 independently are hydrogen, C_1–C_6 alkyl, or $-CH_2R_4$, wherein R_4 is C_2–C_5 alkenyl; or R_2 and R_3 taken together with the adjacent nitrogen atom to which they are attached complete a heterocyclic ring selected from pyrrolidine, piperidine, morpholine, or methyl and dimethyl substituted pyrrolidine, piperidine and morpholine; and the non-toxic pharmaceutically acceptable salts thereof.

4,049,828

INSECTICIDAL AND INSECT-REPELLANT METHODS AND COMPOSITIONS

Larry K. Cole, 2709 Judith Drive, Champaign, Ill. 61820

Continuation-in-part of Ser. No. 494,540, Aug. 5, 1974, abandoned. This application July 14, 1975, Ser. No. 595,277

Int. Cl.[2] A01N *9/24*

U.S. Cl. 424—333 6 Claims

1. A method of killing dipterous and lepidopterous insects which comprises applying to said insects or habitat thereof citral vapors at concentrations of about 1 to 20 ppm. in air.

4,049,829

SULPHUR CONTAINING HYDROXY ALIPHATIC COMPOUNDS

Louis Lafon, Paris, France, assignor to Societe anonyme dite: Laboratoire L. Lafon, Maisons-Alfort, France

Filed Sept. 18, 1975, Ser. No. 614,624

Claims priority, application United Kingdom, Sept. 23, 1974, 41381/74

Int. Cl.[2] A01N *9/00;* C07C *149/18*

U.S. Cl. 424—337 3 Claims

1. A therapeutic composition for treatment of hyperlipemia and/or hypocholesterolemia by oral administration comprising a therapeutically effective amount of a compound selected from the group consisting of 2,2,15,15,-tetramethyl-3,14-dithia-1,16-hexadecanediol and 2,15,-dimethyl-3,14 dithia-1,16 hexadecanediol with a physiologically acceptable excipient.

4,049,830

BOVINE TEAT DIP

Peter T. Pugliese, Bernville, Pa., assignor to Milmark Research, Inc., Bernville, Pa.

Continuation-in-part of Ser. No. 523,333, Nov. 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 366,159, June 1, 1973, abandoned. This application Nov. 6, 1975, Ser. No. 629,222

Int. Cl.[2] A01N *9/24;* A61K *31/045;* A61L *13/00*

U.S. Cl. 424—343 5 Claims

1. A bovine teat dip free of inorganic salts and having a pH of between 5.0 and 5.8, a viscosity of from 4 to 10 centipoise at 37° C. and comprising an oil-in-water emulsion of the following ingredients expressed in parts by weight:

polyethoxycetyl ether	0.5%
75 mole polyoxyethylene ether of whole lanolin	4.6%
lauryl (poly-1-oxapropene) oxaethane carboxylic acid	1.0%
propylene glycol	8.0%
2-bromo-2-nitropropan-1,3 diol	0.2%
organic base as necessary to adjust pH to 5.0 to 5.8	
water as necessary to bring total volume to	100%

4,049,831

NOVEL COMPOSITION CONTAINING FATS OR OILS AND METHOD FOR MANUFACTURING SAME

Fumio Ono, and Yasuo Aoyama, both of Kashiwa, Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Japan

Filed Oct. 23, 1974, Ser. No. 517,247

Claims priority, application Japan, Oct. 31, 1973, 48-121619; Feb. 13, 1974, 49-16820

Int. Cl.[2] A23D *5/00;* A23L *1/04, 1/313*

U.S. Cl. 426—72 17 Claims

9. A method for manufacturing a fat- or oil-containing composition, said composition comprising a fat or oil solubilized in an aqueous solution, said method comprising adding with stirring 0.5 to 6.0 parts by weight of a fat or oil to 1 part by weight of an aqueous solution containing 0.8% to 10% by weight in terms of water-soluble nitrogen of an aqueous extract of an animal meat which extract contains as its main constituent water-soluble and thermally noncoagulable peptides, said aqueous solution having a viscosity of 30 to 50,000 centipoises at 25° C., thus solubilizing said fat or oil in said aqueous solution.

4,049,832

HIGH FAT, FORTIFIED, MARSHMALLOW BASED FOOD BAR

James R. Hayward, McHenry; William L. Keyser, East Dundee, and Walter J. Zielinski, Ingleside, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 2, 1976, Ser. No. 710,451

Int. Cl.[2] A23G *3/00*

U.S. Cl. 426—72 11 Claims

1. Marshmallow low in reducing sugars and having therein up to 10 percent by weight emulsified fat, and from 1–20 percent by weight protein of reduced water binding capability; said emulsified fat containing up to 20 percent by weight emulsifier; said protein of reduced water binding capability being selected from the group consisting of heat treated protein, fat coated protein, and combinations thereof; said reducing sugars being below about 5 percent by weight.

4,049,833

PROCESS FOR TREATING PARTIALLY DEFATTED NUTS

Peter Michael Gannis, Stamford, Conn., and Peter Michael Bosco, Hopewell Junction, N.Y., assignors to Standard Brands Incorporated, New York, N.Y.

Filed Oct. 16, 1975, Ser. No. 623,168
Int. Cl.[2] A23L *1/20*
U.S. Cl. 426—93 9 Claims

1. A process for treating partially defatted nuts comprising contacting the nuts with an aqueous solution containing at least about 2 percent glycerol at a temperature of at least about 150° F for a period of at least about 2 minutes so that at least a portion of said solution is absorbed by the nuts and the nuts are thereby reconstituted, removing the nuts from contact with the solution and roasting the nuts, whereby the resulting nuts have substantially the flavor and texture of roasted nuts which have not been defatted.

4,049,834

HOPS AND METHOD OF MAKING SAME

Günter Bärwald, Seebadstrasse 25, 1 Berlin 28, and Fritz Briem, Obere Hauptstrasse 18, 8301 Au i. d. Hallertau, both of Germany

Filed Apr. 4, 1975, Ser. No. 565,199
Claims priority, application Germany, Apr. 9, 1974, 2417367
Int. Cl.[2] A23L *1/00*
U.S. Cl. 426—106 14 Claims

1. A hop product pressed to form a shaped body comprising dried hop strobiles comminuted to a grain size of from about 2 – 10 mm and admixed with at least one inert inorganic adsorbent in a solid state, the adsorbent being selected from the group consisting of finely divided silica, silicates and aluminum oxide, the amount of the adsorbent being from about 10 to 30 percent, based on the total weight of hops and adsorbent.

4,049,835

PET FOOD PRESERVATION

Gerhard Julius Haas, Woodcliff Lake, N.J., and Edwin Bernard Herman, Yorktown Heights, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 9, 1976, Ser. No. 665,208
Int. Cl.[2] A23B *4/14*
U.S. Cl. 426—106 10 Claims

1. In a method for preparing an intermediate-moisture food comprising pasteurized meat and containing a polyhydric alcohol for antimicrobial purposes, the improvement comprising:

packaging said food in a substantially gas impervious packaging material, and filling the free space in the package with carbon dioxide,

said food containing a level of said polyhydric alcohol which is ineffective in the absence of the carbon dioxide to prevent microbial growth, but effective to prevent microbial growth when the food is packaged in carbon dioxide.

4,049,836

PIE CRUST, DOUGH AND PACKAGE

George B. Davis, Jr., 7512 Marbury Road, Bethesda, Md. 20034

Continuation-in-part of Ser. No. 498,575, Aug. 19, 1974, abandoned. This application Apr. 16, 1976, Ser. No. 677,713
Int. Cl.[2] A21D *10/02*
U.S. Cl. 426—112 20 Claims

1. The package combination disclosed comprising a mass of crust dough, two thinly formed sheets of flexible material secured together about their peripheral edge to form a receptacle inclosing said dough mass significantly larger than the dough mass to provide for reshaping by rolling the dough within the receptacle, means forming air passing ports extending into said receptacle for the passage of air into and from the receptacle as the receptacle is extended and the dough therein rolled into pie crust form said air passing ports being sufficiently small

as to allow the passing of air into and from the receptacle without allowing the viscus dough material extruding excessively from the receptacle through the ports during a normal dough rolling operation and during such time as relatively high pressure are applied to the dough within the receptacle.

4,049,837

CHILL PREVENTION FOR BANANA UNDERPEEL

Hugh T. Freebairn, Houston, Tex., assignor to Catalytic Generators, Inc., Chesapeake, Va.

Filed Dec. 31, 1975, Ser. No. 645,644
Int. Cl.[2] A23B *7/14*
U.S. Cl. 426—308 30 Claims

1. A method of swelling the cell membranes of the cells surrounding the latex containing vessels in the underpeel of bananas to enable these latex vessels to be more resistant to temperatures within the range of 45° to 55° F, the method comprising,

treating the exterior peel of a banana finger with an application of an oleaginous material having a viscosity of 10 to 10,000 centistokes,

maintaining the temperature of the underpeel above 55° F during said application and holding the underpeel for a dwell period of at least 24 hours,

applying a sufficient amount of said oleaginous material to permit said oleaginous material to penetrate below the exterior peel and into the sites of the latex vessel cell membranes to thereby swell said membranes in order to prevent both a phase change in the cell membranes and an increase in the permeability for the liquid and solutes of the cells surrounding the latex vessels into the latex contained in these vessels.

5. The process of claim 1 wherein the electron-spin resonance in the cell membranes is changed and the cell membrane permeability to phosphate ions is decreased.

4,049,838

MANUFACTURE OF LARGE CHEESE BLOCKS

Grant Edward Krueger, and Richard John Leitner, both of Green Bay, Wis., assignors to Kraft, Inc., Glenview, Ill.

Division of Ser. No. 388,101, Aug. 13, 1973, Pat. No. 3,969,995. This application June 3, 1976, Ser. No. 692,491
Int. Cl.[2] A23C *19/02*
U.S. Cl. 426—478 7 Claims

1. A method for manufacturing cheese from curd in particulate form comprising the steps of filling the curd into a container, locating a perforated V-shaped blade having spaced side walls in the curd, opening the curd by means of the blade a maximum distance of two inches, rotating the container about an axis genrally in the plane of the blade, applying pressure to the curd while the blade is in the curd, draining the curd through the blade, and removing the blade with minimum disturbance of the curd so as to permit knitting of the curd to provide a cheese block of uniform texture.

4,049,839

PHYSIOCHEMICALLY DESIGNED FAT COMPOSITIONS FROM TALLOW

Francis E. Luddy, Hatboro; James W. Hampson, and Samuel F. Herb, both of Philadelphia, all of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 337,789, March 5, 1973, Pat. No. 3,944,585. This application Dec. 22, 1975, Ser. No. 642,837

Int. Cl.[2] A23D *3/00, 5/00*

U.S. Cl. 426—607 5 Claims

1. A high melting crystalline tallow fraction useful for hardening shortenings and margarine stock consisting essentially of trisaturated glycerides with a minor amount of disaturated, monounsaturated glycerides, said fraction having a gas-liquid chromatographic profile indicating a composition having 12%, 31%, 39%, and 18% of glycerides having carbon numbers of 48, 50, 52 and 54, respectively, and a thermal profile indicating softening at about 40° C., commencement of rapid melting at about 50° C. and complete melting at about 57° C.

4,049,840

PROCESS FOR PREPARING AN EXPANDED SOY PRODUCT

Stanley H. Reesman, and Charles R. Eldred, both of Battle Creek, Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 189,735, Oct. 15, 1971, abandoned. This application Sept. 8, 1975, Ser. No. 611,592

Int. Cl.[2] A23L *1/20*

U.S. Cl. 426—634 1 Claim

1. A process for preparing an expanded soy product simulating meat in texture and having a reduced soy flavor, which comprises:

blending a soy mixture comprising soy, from about 1 to about 50% semolina based on the combined weight of soy and semolina, water, and a sulfur compound in an amount sufficient to aid expansion;

heating and mechanically working the soy mixture under pressure, the heating being sufficient in degree to cook the soy and raise the temperature to at least 250° up to 320° F; and

extruding the soy mixture to effect expansion of the cooked soy mixture.

4,049,841

SPRAYED CATHODES

Thomas G. Coker, Southgate, and Shyam D. Argade, Woodhaven, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Sept. 8, 1975, Ser. No. 611,030

Int. Cl.[2] B05D *1/10, 5/12, 7/14*

U.S. Cl. 427—34 9 Claims

1. In a method for manufacturing a chlor-alkali electrolytic cell wherein the cathode is prepared by coating a ferrous metal substrate with a metal, the improvement comprising:

spray coating the ferrous metal substrate with a powder metal to bond the powder metal to the substrate the powder metal having a lower hydrogen overvoltage than the substrate, the powder metal increasing the surface area of the cathode while maintaining efficient hydrogen bubble release.

4,049,842

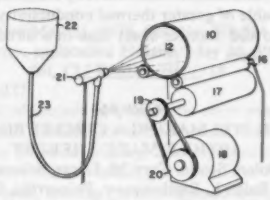
PROCESS FOR INTERIOR COATING SMALL MOUTH CONTAINER OPEN AT ONE END

Gene Gerek, and Robert G. Coucher, both of Salt Lake City, Utah, assignors to EPPCO, Salt Lake City, Utah

Division of Ser. No. 486,464, July 8, 1974, Pat. No. 3,947,617. This application Dec. 29, 1975, Ser. No. 644,926

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—34 22 Claims



1. A plasma spray process for coating the interior of a thin-walled cylindrical container with a closed end and an open end with a coating having a thickness of less than 1 mil comprising:

a. introducing finely divided resin particles into the region of a plasma arc flame have a temperature greater than the melting point of said resin;

b. maintaining the residence time of said resin particles in the vicinity of said flame for a period sufficiently long to soften substantially at least the surface of said particles passing through said region of a plasma generated flame;

c. rotating said container about its central longitudinal axis at a rotational speed sufficient to create a vortex;

d. propelling said softened resinous particles into the interior of said container with sufficient velocity to impact said resinous particles with the container interior to cause said particles to adhere and flow upon the interior surface of said container to coat same with a substantially uniform coating which is curable to a continuous film having a thickness less than about one mil.

4,049,843

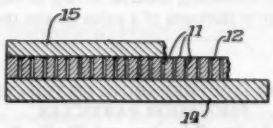
IMAGE TRANSFER LAYERS FOR INFRARED TRANSFER PROCESSES

Joseph Gaynor, Arcadia, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 330,337, Feb. 7, 1973, Pat. No. 3,970,002, which is a division of Ser. No. 83,397, Oct. 23, 1970, Pat. No. 3,730,091. This application Mar. 13, 1975, Ser. No. 558,084

Int. Cl.[2] B05D *3/06;* B41M *3/12*

U.S. Cl. 427—43 2 Claims



2. In the process for reproducing radiation absorbing images disposed on the surface of an original by exposing said original to radiant energy sufficient to generate a heat pattern thereon corresponding to radiation absorbing imaged areas and non-imaged areas on the surface of said original, and transferring said heat pattern to a transfer material comprising dye, wax and oil on a transfer sheet disposed in heat transfer relation to said original, the improvemment comprising dispersing a plurality of thermally and electrically conductive particles selected from the group consisting of copper, silver, iron, nickel, cobalt, iron oxide, nickel oxide, copper oxide, manganese dioxide, and magnesium oxide, said particles with one dimension longer than the other dimensions in said transfer material

wherein sufficient particles are disposed in said transfer material to yield a lateral particle frequency in said transfer material of about 10 to 20 particles per millimeter and wherein said transfer material is disposed in a 0.5 mil thick layer between said original and said transfer sheet and the length of said particles dispersed in said transfer material is 0.40 to 0.45 mils, and subjecting said transfer material to an electrical field sufficient to align said longer dimension of said particles contained in said transfer material into positions parallel to said field and transverse to said transfer sheet thereby rendering said transfer material capable of greater thermal conductivity in a direction transverse to said transfer sheet than in a direction lateral to said transfer sheet.

4,049,844

METHOD FOR MAKING A CIRCUIT BOARD AND ARTICLE MADE THEREBY

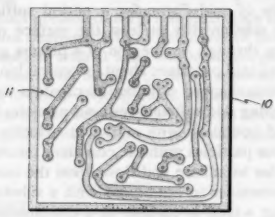
Donald A. Bolon, Scotia; Gary M. Lucas, Schenectady, both of N.Y., and Ralph L. Bartholomew, Painesville, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 509,893, Sept. 27, 1974, Pat. No. 3,988,647. This application Mar. 24, 1976, Ser. No. 670,044

The portion of the term of this patent subsequent to July 6, 1993, has been disclaimed.

Int. Cl.[2] B05D *5/06*; H01B *1/02*

U.S. Cl. 427—54 **9 Claims**



1. A method for making a circuit board having conductive circuit elements with a specific resistivity of less than 10 ohm-cm patterned on a nonconductive substrate, which comprises,

1. printing a radiation curable ink onto the nonconductive substrate to a desired circuit pattern, and
2. effecting the radiation cure of the radiation curable ink, where said radiation curable ink comprises by volume
   - A. from about 10% to 60% of an organic resin binder having a viscosity of from 50 to 10,000 centipoises at 25° C., and
   - B. from about 90% to 40% of a particulated electrically conductive metal containing material substantially free of metal containing material having an aspect ratio of diameter to thickness of a value greater than 20.

4,049,845

METHOD FOR PREPARING FILTER-COATED PHOSPHOR PARTICLES

Gerald Scott Lozier, Princeton, and Phyllis Brown Branin, Lawrenceville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,766

Int. Cl.[2] B05D *5/06, 5/12*

U.S. Cl. 427—68 **12 Claims**

1. A method for coating phosphor particles with discrete filter particles comprising

- a. adsorbing in an aqueous medium colloidal particles of a latex onto said phosphor particles,
- b. dispersing filter particles in an aqueous medium,
- c. combining said phosphor particles and said filter particles in an aqueous medium
- d. and coagulating the combined mixture of phosphor particles with adsorbed colloidal particles thereon and filter particles while in an aqueous medium.

4,049,846

PHOTOCHROMIC PLASTIC MATERIALS

Richard J. Hovey, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed June 11, 1976, Ser. No. 694,963

Int. Cl.[2] G02F *1/01*; G02B *1/10, 1/12*; B05D *5/06*

U.S. Cl. 427—164 **21 Claims**

1. A process for producing a photochromic plastic material characterized by the steps of:

forming a transparent polymeric material from:

- a first component consisting essentially of at least one unsaturated polyester resin produced by esterification of a polybasic, unsaturated organic acid with a polyhydric alcohol, and
- a second component consisting essentially of a polar vinyl monomer;

contacting said material with a solvent to swell a surface layer thereof;

contacting said surface layer with halide ions chosen from the group consisting of chloride, iodide, bromide, and mixtures thereof;

contacting said surface layer with silver ions; and

removing retained solvents from said material to collapse said swelled surface layer.

4,049,847

PRODUCTION OF SELF-ADHESIVE COATINGS ON FLAT SUBSTRATES

Klaus Eisentraeger, Ludwigshafen; Güenther Immel, Weinheim; Matthias Marx, Bad Duerkheim; Hans Reinhard; Herbert Spoor, both of Limburgerhof, and Gerhard Storck, Ruchheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 10, 1972, Ser. No. 270,095

Claims priority, application Germany, July 12, 1971, 2134688

Int. Cl.[2] C09J *7/02*

U.S. Cl. 427—207 B **10 Claims**

1. A process for the production of self-adhesive coatings by applying thin films of self-adhesive polyacrylates to the surface of flat substrates which comprises applying to said surface a mixture of

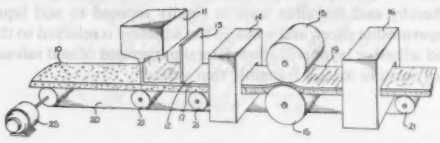
- A. a copolymer of
  - a. from 0.3 to 10% w/w of a C_{3-5} mono-olefinically unsaturated mono- or di-carboxylic acid or a vinyl monomer containing at least one hydroxyl group with
  - b. up to 99.7% w/w of an alkyl acrylate having C_{6-12} alkyl groups,
  - c. from 0 to 60% w/w of mono-olefinically unsaturated C_{4-7} carboxylates and
  - d. from 0 to 10% w/w of other olefinically unsaturated monomers;
- B. from 0.5 to 8% by weight of the weight of copolymer (A) of melamine/formaldehyde resins, the molar ratio of melamine to formaldehyde in the melamine/formaldehyde resin being from 1:3 to 1:6

and heating the coating to a temperature of at least 50° C.

4,049,848
TEXTURED-FOAM COATED URETHANE WALL AND CEILING COVERING AND METHOD OF MAKING THE SAME

Clark W. Goodale, Canoga Park; Charles W. Morgan, Rolling Hills, and Albert L. Rhoton, Cypress, all of Calif., assignors to United Foam Corporation, Compton, Calif.

Continuation-in-part of Ser. No. 532,315, Dec. 13, 1974, abandoned. This application Nov. 19, 1976, Ser. No. 743,169
Int. Cl.[2] B05D 5/00; B32B 5/18
U.S. Cl. 427—244 42 Claims



1. A method for producing a composite building material having a continuously textured surface, comprising:

a. providing (i) a foamed emulsion of an uncured and uncross-linked elastomeric resin composition and (ii) a self-supporting resilient urethane foam substrate having an irregular sea sponge cell structure;

b. disposing said foamed elastomeric resin composition onto a surface of said urethane substrate to form a substantially uniform coating of predetermined thickness on the substrate, said thickness being such as to permit the irregular cell structure of the underlying sea sponge substrate to affect the exposed surface of the elastomeric layer in the subsequent step (d) so that after the composite structure is fully processed said textured surface is formed therein;

c. drying said elastomeric resin foam coating until said elastomeric resin foam forms a layer which is only partially cured and partially cross-linked, such that when said partially cured elastomeric layer of the composite structure is crushed, it will deform the cells of the underlying urethane and become interlocked therein to prevent delamination of said elastomeric layer;

d. crushing said composite structure so that said partially cured elastomeric layer is densified and caused to be interlocked into the adjacent cells on said urethane substrate surface which cells have been distorted by the crushing, the resultant partial compression and distortion of the elastomeric foam creating a continuous texture on the exposed surface thereof; and

e. further curing said textured elastomeric layer to hold said textured surface and forming said composite building material.

4,049,849
INHIBITING LEACHING OF FIRE RETARDANT SALTS FROM WOOD WITH CYCLIC SULFONIUM ZWITTERION SOLUTION IMPREGNANT

Frederick L. Brown, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 14, 1976, Ser. No. 676,764
Int. Cl.[2] B05D 3/12
U.S. Cl. 427—325 10 Claims

1. A process for inhibiting the leaching of a fire retardant salt from a wood substrate comprising:

a. impregnating the wood substrate with either

i. an aqueous solution comprising between about 5 and about 40 weight percent solids, the solids consisting of the fire retardant salt and a cyclic sulfonium zwitterion at a fire retardant salt:cyclic sulfonium zwitterion weight ratio between about 1:1 and about 20:1; or

ii. subsequent to impregnating the wood substrate with the fire retardant salt, with an aqueous solution comprising between about 1 and about 40 weight percent of the cyclic sulfonium zwitterion; and

b. curing the resulting cyclic sulfonium zwitterion-impregnated wood substrate.

4,049,850
METHOD OF CURING PLASTIC RAW MATERIALS IMPREGNATED IN A POROUS STUFF SUCH AS WOOD

Heikki Pentti, Kemi, Finland, assignor to Kemi Oy, Kemi, Finland

Filed May 21, 1975, Ser. No. 579,554
Claims priority, application Finland, May 24, 1974, 741596
Int. Cl.[2] B05D 3/02, 1/18
U.S. Cl. 427—377 8 Claims

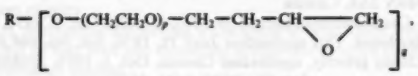
1. A method of subjecting a synthetic resin impregnant in a porous cellulosic material to an exothermic curing reaction, comprising the steps of placing the impregnated cellulosic material into a vessel, introducing a medium of high specific heat into the vessel, heating the impregnated material with the medium above the boiling point thereof to initiate the curing reaction, the medium cooling down to at least the phase transition temperature thereof as it delivers heat to the reaction to produce a condensate of the medium, and interrupting the introduction of the medium to the vessel after the reaction has been initiated whereby the condensate on the surface of the impregnated material functions as a coolant effectively binding the reaction heat of the exothermic curing reaction and preventing overheating during heating above the phase transition temperature.

4,049,851
MANUFACTURE OF BONDED TEXTILE SHEET MATERIALS

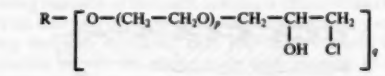
Norbert Greif; Rolf Fikentscher, both of Ludwigshafen, and Axel Sanner, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 12, 1976, Ser. No. 666,461
Claims priority, application Germany, Mar. 21, 1975, 2512515; Jan. 30, 1976, 2603473
Int. Cl.[2] B44D 1/09; C08J 1/44
U.S. Cl. 427—386 3 Claims

1. In a process for the manufacture of bonded textile sheet materials having improved water vapor absorbency by bonding textile sheets with polymeric binders and additionally impregnating the textile sheets with impregnants and drying the impregnated textile sheets at from 40° to 100° C, the improvement wherein the textile sheet is impregnated with from 6 to 40 percent by weight, based on the bonded, impregnated and dried sheet, of an impregnant selected from the group consisting of glycidyl ethers of the general formula (I)



chlorohydrin compounds of the general formula (II)



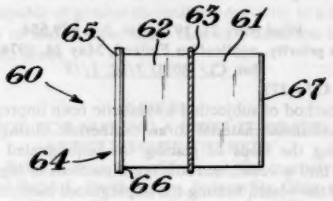
and reaction products of the chlorohydrin compounds (II) with aliphatic amines of 2 to 10 carbon atoms and having from 2 to 4 amino groups, in which general formulae (I) and (II) R is a divalent to hexavalent aliphatic or cycloaliphatic hydrocarbon radical of 2 to 13 carbon atoms, p is an integer from 1 to 30 and q is an integer from 2 to 6, and the impregnants are fixed to the textile sheets by means of compounds containing NH groups.

4,049,852

LAMINATE PREPARATION AND APPLICATION THEREOF

Hubert Stacy Smith, Jr., Essexville, and Robert A. Hay, II, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 2, 1975, Ser. No. 609,468
Int. Cl.[2] B32B *3/26*
U.S. Cl. 428—55 9 Claims



6. A laminate of a plurality of elongate foamed synthetic resinous bodies, the laminate comprising

a first plurality of elongate generally rectangular foamed resinous bodies,

a second plurality of elongate generally rectangular synthetic resinous bodies, the first plurality of synthetic resinous bodies being arranged in end-to-end relationship, the second plurality of bodies also being arranged in end-to-end relationship, the first and second plurality being in generally parallel face-to-face arrangement, the first and second plurality of bodies each having a plurality of locations where adjacent elements abut, the abutting locations of the first plurality of bodies and the second plurality of bodies being axially displaced from each other,

a reinforcement member being disposed between the first and second plurality of bodies, the first and second plurality of bodies, the first and second plurality having having adjacent faces connected,

a skin member being generally impervious to organic vapors being disposed generally parallel to the reinforcement member and connected to the first plurality at a location remote from the reinforcement member with the further limitation that

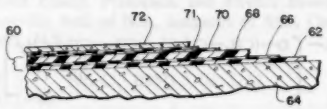
the abutting ends of the first plurality and the abutting ends of the second plurality are pressed together with a force sufficient that no visible gap exists between adjacent ends.

4,049,853

TERRAZZO STRUCTURE HAVING A SUB-SURFACE AND AN INTERMEDIATE IMPERMEABLE SHEET

Norman Patrick Tortolo, 20 Ellins Avenue, Toronto, Ontario, M6N 2A3, Canada

Continuation-in-part of Ser. No. 511,010, Oct. 1, 1974, abandoned. This application June 21, 1976, Ser. No. 698,616
Claims priority, application Canada, Oct. 1, 1975, 236850
Int. Cl.[2] B32B *5/28, 13/12*
U.S. Cl. 428—70 17 Claims



1. In combination, a sub-surface, a sheet of flexible premanufactured liquid impermeable material, an elastomeric adhesive securing said sheet to said sub-surface, a frangible thin facing veneer, and a bonding agent securing said facing veneer to said liquid impermeable sheet, said bonding agent compatible with said sheet material and with said facing veneer whereby said facing veneer is rigidly secured to said liquid impermeable sheet, which facing veneer is applied in the form of a wet slurry mix, said elastomeric adhesive permitting lateral movement of said sub-surface relative to said facing veneer.

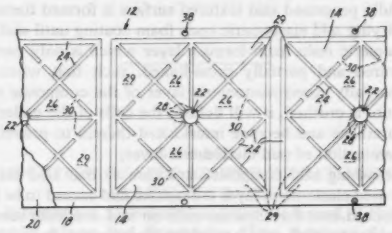
10. A method for attaching a frangible thin facing veneer to a planar sub-surface comprising: causing adherence of a premanufactured liquid impermeable sheet to a sub-surface by an adhesive layer and applying said frangible veneer thereover while in a wet slurry state and bonding said frangible layer to said liquid impermeable sheet through a bonding agent compatible with said impermeable sheet and facing veneer whereby said frangible layer is rigidly secured to said liquid impermeable sheet, and wherein the adhesive is selected so that said adhesive layer will allow lateral movement of said sub-surface relative to said frangible thin veneer.

4,049,854

SYSTEM FOR INFLATION AND SEALING OF AIR CUSHIONS

James H. Casey, Roseville; Curtis Lee Larson, St. Paul, and Robert Campbell Brown, Falcon Heights, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 471,580, May 20, 1974, abandoned. This application Mar. 4, 1976, Ser. No. 663,739
Int. Cl.[2] B65B *31/04*
U.S. Cl. 428—72 1 Claim



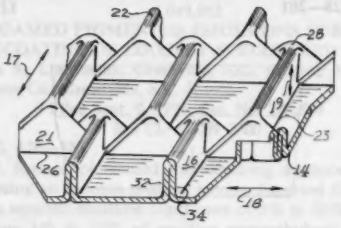
1. A concatenation of uninflated cushions, comprising two elongate, flexible films, each film comprising a heat sealable thermoplastic material forming at least one surface of the film, at least one of said films having a plurality of longitudinally spaced openings, said films being longitudinally aligned and positioned with their thermoplastic surfaces adjacent and with all adjacent portions of their thermoplastic surfaces in face-to-face contact, said films being fused together in discrete areas to define a plurality of cushions, each of said cushions including a continuously fused area extending entirely around each of said openings and fused areas within said continuous fused area defining a plurality of unsealed adjacent surface areas in a pattern providing inflatable primary chambers between the films and disposed around the opening, inflatable inlet passageways communicating between the opening and the primary chambers around the opening, secondary inflatable chambers adjacent said primary chambers, and a crossover passageway for each of said secondary inflatable chambers communicating between the secondary chamber and one of said primary chambers with the opening providing the only inlet to the chambers and passageways so that air directed through the opening into the inlet passageways will simultaneously inflate the primary chambers and via the crossover passageways the secondary chambers, which inflated chambers can then be sealed by heat sealing the inlet passageways in a band around that opening.

4,049,855

BOXCELL CORE AND PANEL

Scott Douglas Cogan, 7275 Demar Road, Cincinnati, Ohio 45243

Filed Mar. 22, 1976, Ser. No. 669,381
Int. Cl.² B32B 3/00
U.S. Cl. 428—116 4 Claims



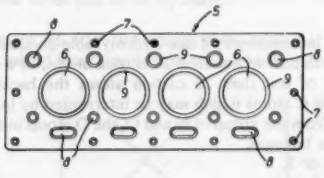
1. A structural monolithic cellular core element consisting of a multiplicity of rectangular cell openings within the body of the material, two sides of all said rectangular cell openings being a plurality of parallel pleats projecting substantially normal to the plane of one side of said material, said pleats being in rows whereas the rows extend in a direction normal to the plane of said pleats and the pleats are uniformly spaced, the depth of said pleats measured in a direction normal to the plane of said material being approximately one-half the distance between adjacent pleats in a single said row of pleats, adjacent said rows of pleats have an off-set of said pleats a distance approximately equal to the said pleat depth, the length of said pleats measured in the direction of the pleat fold being essentially the same for all pleats in a single said row of pleats and the pleats terminate in length at each end into triangular gathering folds thereof directed in planes substantially normal to the planes of said pleats and closing the remaining two sides of said rectangular cell openings, said triangular gathering folds being isosceles in transverse cross section and having an altitude essentially equal to the said pleat depth with the apex angle of said triangular gathering folds bisected by said pleats and said triangular gathering folds have a base length equal to the distance between two adjacent pleats in said row of pleats, the said triangular gathering fold base length being in the plane of said material, the side of said material opposite the projecting said pleats and said triangular gathering folds being a plane and closing one end of said rectangular cell openings.

4,049,856

GASKETS

David John Adams, Great Haywood, England, assignor to TBA Industrial Products Limited, England

Continuation-in-part of Ser. No. 515,410, Oct. 16, 1976, abandoned. This application May 24, 1976, Ser. No. 689,251
Int. Cl.² B32B 1/10; F02F 1/00
U.S. Cl. 428—131 6 Claims



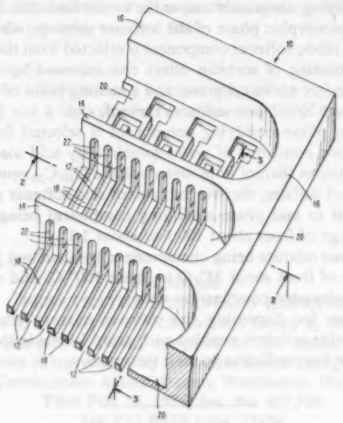
1. A metal-cored gasket comprising, in combination:
a metal core;
a facing layer bonded to each side of said core, at least one opening through said core and said facing layer, an eyelet in said opening, said eyelet having flanges seated in said facing layers in facing layer deforming relation, each facing layer consisting essentially of asbestos, rubber and microspheres, said rubber and asbestos being present in relative amounts so as to exhibit a compression set greater than 50% in the absence of said microspheres, said microspheres being present in amount up to 75% by volume and which amount is sufficient locally to modify said facing layer to permit crushing thereof by an associated eyelet flange at a pressure to protect said eyelet from incipient cracks incident to incorporation thereof in the gasket.

4,049,857

DEPOSITION MASK AND METHODS OF MAKING SAME

Robert Hammer, Brookfield Center, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 28, 1976, Ser. No. 709,357
Int. Cl.² B32B 3/10; B05D 5/00; B05C 11/16
U.S. Cl. 428—136 2 Claims



1. A vapor deposition mask comprising an integral body of material having a web reinforced by at least one rib,
the web having a thickness small compared with that of other portions of said mask and adapted to seat against the surface upon which vaporized material is to be deposited through said mask,
openings extending through said web to define the deposited pattern, at least some of said openings being positioned close to each other so that between each such pair of adjacent openings there is an intervening part of said web having relatively small cross-sectional size and little inherent rigidity,
each reinforcing rib having a thickness at least three times that of said web and extending across one or more of said openings therein,
at least some of said openings extending from a point on one side of said rib to a point on the other side of said rib,
the portion of said rib which bridges each of said openings being recessed so that such opening is effectively extended from said web into said rib to a depth substantially exceeding the web thickness, thus providing a raised bridge portion in said rib above each such opening to afford ample clearance for the passage of vaporized material around said rib and through such opening, said rib giving sufficient support to the tenuous portions of said web which are located between or surrounded by openings in said web to hold such web portions against substantial movements relative to each other and the adjacent parts of the mask while the mask is disengaged from said surface, thereby insuring that said mask is usable repetitively in vapor depositing operations notwithstanding the inherent

weakness that such tenuous web portions would have in the absence of support by said rib.

4,049,858

ARTICLE FOR SOFTENING FABRICS IN AN AUTOMATIC CLOTHES DRYER

Alan P. Murphy, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 12, 1974, Ser. No. 532,276
Int. Cl.² D06M *13/16*
U.S. Cl. 428—136 **10 Claims**

1. A non-staining fabric softening article, especially adapted for use in an automatic clothes dryer, comprising:

a. a fabric conditioning amount of a softener mixture being substantially free of unneutralized fatty acids, said mixture comprising a fabric softener component and a phase-modifying component wherein the presence of said phase-modifying component causes the formation in the dryer of a mesomorphic phase of the softener mixture, wherein:

i. the fabric softener component is selected from the group consisting of sorbitan esters characterized by at least one free hydroxyl group and a melting point of at least about 38° C, and mixtures thereof; and

ii. the phase-modifying component is selected from the group consisting of water-soluble fatty acid soaps, and mixtures thereof with water-soluble C_{10}-C_{20} neutralized alkyl sulfates, the weight ratio of said softener component to said phase-modifying component being in the range of from about 100:1 to about 1:1;

said softener mixture being characterized by a melting point in the range of from about 38° C to about 100° C, said mixture being in releasable combination with;

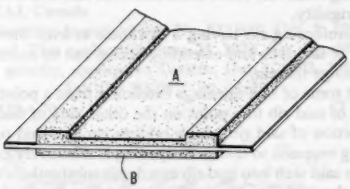
b. means for dispensing the softener mixture when said softening article is tumbled with damp fabrics in the dryer under heat sufficient to melt the mixture.

4,049,859

METALLIZED FILM

Shinsuke Yoshikawa; Tohru Sasaki, and Syuuzi Terasaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1976, Ser. No. 654,820
Claims priority, application Japan, Feb. 3, 1975, 50-13320
Int. Cl.² H01L *41/10*
U.S. Cl. 428—172 **7 Claims**



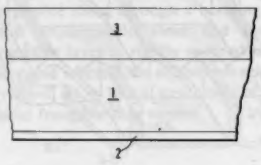
1. In a metallized thermoplastic resin film constituting a transducer and having deposited metal layers on both surfaces thereof, the improvement comprising, at least a portion of said metal layer on one surface of said film having a first thickness between 700–5000A, and at least a portion of said metal layer the other surface of said film, at positions on said other surface opposite to the position of said first thickness portion, having a second thickness between 100–600 A.

4,049,860

PAPER SUPPORT CARRYING ANTI-ADHESIVE LAYER

Ludwig Armbrust, Hassloch, and Jürgen Neubert, Esthal, both of Germany, assignors to Hoffmann & Engelmann, Germany

Filed Nov. 17, 1976, Ser. No. 742,577
Claims priority, application Germany, Nov. 19, 1975, 2551860
Int. Cl.² B32B *3/00*
U.S. Cl. 428—201 **12 Claims**



1. In a paper support for receiving on one side thereof layers of print and/or varnish, in particular for receiving transfer images,

the improvement comprising a water-permeable covering layer on the other side containing polyvinyl alcohol, a polysiloxane, and a polyalkyleneglycol wax.

10. An article comprising a support as claimed in claim **1** bearing at least one transfer image on the surface remote from said covering.

11. An article as claimed in claim **10** wherein each transfer image is adhered to said remote surface by an adhesive and has a protective coating thereon.

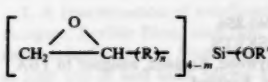
4,049,861

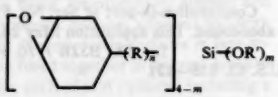
ABRASION RESISTANT COATINGS

Mohammad S. Nozari, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 556,392, March 7, 1975, abandoned. This application Feb. 19, 1976, Ser. No. 659,527
Int. Cl.² B32B *27/38, 27/26*
U.S. Cl. 428—220 **31 Claims**

1. A coated article comprising a substrate and an abrasion resistant coating on the substrate wherein said coating is from 0.1 to 500 microns thick and comprises a polymer comprising at least 15 percent by weight of units from an epoxy-terminated silane represented by the formulae:





wherein

each R is independently a non-hydrolyzable divalent hydrocarbon radical of less than 20 carbon atoms, or a divalent radical of less than 20 carbon atoms the backbone of which is C atoms which may be interrupted by individual atoms from the group of N and O, the O atoms in the form of ether linkages,

m is 1, 2, or 3,

n is 0, or 1, and

R′ is an aliphatic hydrocarbon radical of less than 10 carbon atoms, an acyl radical of less than 10 carbon atoms, or a radical of the formula $(CH_2CH_2O)_kZ$ in which *k* is an integer of at least 1, and Z is hydrogen or an aliphatic hydrocarbon radical of less than 10 carbon atoms,

cured in the presence of a catalytically active amount of a

highly fluorinated sulfonylic catalyst comprising two highly fluorinated aliphatic sulfonyl groups attached directly to an imide or a methylene or highly fluorinated sulfonic catalyst comprising a highly fluorinated aliphatic sulfonic acid or salt thereof.

4,049,862

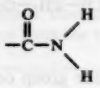
FOAMED PIGMENTED EMULSIONS FOR THE BACKCOATING OF LOOSELY STRUCTURED FABRICS

Martin K. Lindemann, Greenville, S.C., assignor to Chas. S. Tanner Co., Greenville, S.C.

Filed Sept. 9, 1976, Ser. No. 720,839
Int. Cl.[2] B32B *7/00*
U.S. Cl. 428—253 10 Claims

1. A foamed pigmented thermosetting aqueous emulsion comprising an aqueous medium having dispersed therein:

1. an aqueous emulsion copolymer of 5% to 40% ethylene, from 1% to 10% of reactive monoethylenic monomer comprising monoethylenic monomer carrying the



group, and the balance of said copolymer consisting essentially of vinyl ester of saturated monocarboxylic acid;

2. mineral filler providing a pigment to binder ratio of at least 0.5:1, said filler having a alkaline character; and

3. surfactant for stabilizing said emulsion; said aqueous emulsion having a viscosity of from 500 to 15,000 centipoises and being foamed to increase the volume thereof to an extent of from 0.5 to 4 times the original volume.

4,049,863

FLUOROPOLYMER PRIMER HAVING IMPROVED SCRATCH RESISTANCE

Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 600,577, July 31, 1975, abandoned. This application June 30, 1976, Ser. No. 701,745
Int. Cl.[2] B32B *27/00*; C08G *51/24*; C08J *1/48*
U.S. Cl. 428—324 23 Claims

1. A coating composition comprising

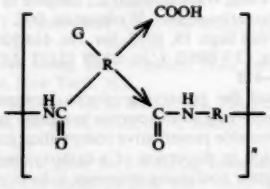
a. about 10%–90%, by weight of the total of (a) and (b) solids, of a particulate polymer of monoethylenically unsaturated hydrocarbon monomers completely substituted with fluorine atoms or a combination of fluorine atoms and chlorine atoms, the polymer having a number average molecular weight of at least 20,000;

b. about 10%–90%, by weight of the total of (a) and (b) solids, of a binder which comprises

1. about 5%–95%, by weight of the total of (1) and (2), of a colloidal silica which air-dries to form a continuous film when laid down by itself,

and

2. about 5%–95%, by weight of the total of (1) and (2), of a salt of a polyamide acid represented by the structure



where

G is a hydrogen or a carboxyl group; → denotes isomerism;

R is a tetravalent organic radical containing at least two carbon atoms, no more than two carbonyl groups of each polyamide acid unit being attached to any carbon atom of said tetravalent radical;

R_1 is a divalent radical containing at least two carbon atoms, the amide groups of adjacent polyamide acid units each being attached to separate atoms of said divalent radical;

and

n is a number large enough to give the polyamide acid an inherent viscosity of at least 0.1, measured as a 0.5% solution in N,N-dimethylacetamide at 30° C,

neutralized with a stoichiometric amount of a tertiary amine;

c. about 10–90%, by weight of (b) (2), of N-methyl pyrrolidone, dimethylformamide, dimethylacetamide, dimethylsulfoxide, cresylic acid, sulfolane or formamide;

d. about 0.2–20%, by weight of the total of (a), (b) (1), (b) (2), (c), and (d), of mica particles, mica particles coated with pigment, or metal flake;

and

e. a liquid carrier.

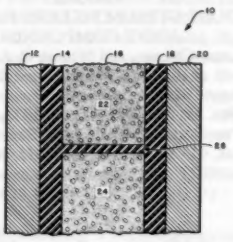
12. An article bearing a primer coat of the composition of claim 1 and a topcoat of a fused fluoropolymer enamel.

4,049,864

PENETRATION RESISTANT BARRIER

William R. Hoover; Keith E. Mead, and Henry K. Street, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 12, 1976, Ser. No. 657,518
Int. Cl.[2] B32B *9/04, 15/04*
U.S. Cl. 428—332 3 Claims



1. A barrier for resisting penetration by cutting torch and hand tools comprising:

an outer plate of mild steel from about 50 mils to about 1 inch thick;

a first layer of silicone rubber from about ¼ inch to about ½ inch thick;

a layer of epoxy resin impregnated ceramic firebrick up to about 1 foot thick;

a second layer of silicone rubber from about ¼ inch to about ½ inch thick, said first and second layers of silicone rubber sandwiching said ceramic firebrick layer between them; and

an inner plate of mild steel from about 50 mils to about 1 inch thick, said inner and outer plates of steel sandwiching between them said first mentioned sandwiched firebrick and silicone rubber layers.

4,049,865

GLASS FIBERS CONTAINING A DUAL POLYESTER RESIN SIZE

John Maaghul, Monroeville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 606,272, Aug. 20, 1975, which is a division of Ser. No. 512,646, Oct. 7, 1974, Pat. No. 3,936,285. This application Nov. 11, 1976, Ser. No. 740,982
Int. Cl.[2] C08L 33/04; D02G 3/00
U.S. Cl. 428—391 3 Claims

1. Glass fibers having thereon the dried residue of a sizing composition comprising:

a water solubilized, condensation, cross-linkable, first unsaturated polyester resin, said polyester resin substantially insoluble in aromatic solvents when crosslinked;

a second unsaturated water dispersible and insoluble polyester resin, said second polyester resin being insoluble in said first polyester resin in a water solution and said second polyester resin preventing the migration of said sizing composition;

a plasticizer;

a first silane coupling agent to promote adhesion between said glass fibers and said resin matrix;

a second silane coupling agent to control the wetting of said glass fibers by said first silane coupling agent;

a thermoplastic polymer being of sufficiently low molecular weight to impart pressure sensitive adhesive characteristics to said sizing composition; and

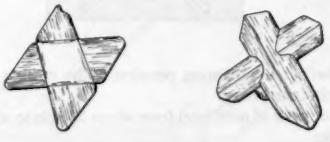
a major amount of water.

4,049,866

BY-PRODUCT GYPSUM FILLERS FOR MICA-FREE JOINT COMPOUNDS

Marvin K. Lane, Chicago, and Winton C. Anderson, Elk Grove Village, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 359,392, May 11, 1973, Pat. No. 3,975,320. This application Mar. 4, 1976, Ser. No. 663,585
Int. Cl.[2] B32B 5/16; C04B 11/00, 11/02
U.S. Cl. 428—402 4 Claims



1. A filler for a crack-resistant, drying type joint compound, consisting essentially of calcium sulfate dihydrate synthetically produced from the citric acid process and further processed to have a particle size distribution characterized by

a mean particle size of between about 11 and about 12 microns,

particles having a size smaller than one micron comprising between about 5% and about 6.5% by weight of the filler, and

a packed dry bulk volume no greater than about 93 cc. per 100 grams.

4,049,867

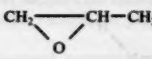
THERMOSETTING RESIN COMPOSITION COMPRISING AN [(2,3-EPOXYPROPOXY)ALKYL]TRIALKYLOXYSILANE

Akihiko Ito; Isao Kaetsu; Hiroshi Okubo; Masamichi Kato, all of Takasaki; Koichiro Hayashi, Suita, and Yuji Maeda, Tokyo, all of Japan, assignors to Japan Atomic Energy Research Institute and Tokyo Optical Company, Ltd., both of Tokyo, Japan

Division of Ser. No. 448,572, March 6, 1974, abandoned. This application Dec. 23, 1975, Ser. No. 643,890
Claims priority, application Japan, Mar. 8, 1973, 48-026594
Int. Cl.[2] B32B 27/38, 27/08
U.S. Cl. 428—412 6 Claims

1. A resin composite comprising a plastic substrate and a cured, abrasion resistant, transparent coating formed from a thermosetting resin composition comprising:

a. at least one [(2,3-epoxypropoxy)alkyl] trialkoxysilane represented by a general formula:



whereby R is an alkylene group containing up to 4 carbon atoms and R′ is an alkyl group containing up to 4 carbon atoms, and

b. at least one selected from the group consisting of polymers and copolymers of epoxy-group containing vinyl monomers selected from the group consisting of glycidyl acrylate, 3,4-epoxybutyl methacrylate, 3,4-epoxybutyl acrylate, 4,5-epoxypentyl methacrylate and 4,5-epoxypentyl acrylate, which coating is cured by heating with addition of a ring-opening polymerization catalyst and wherein (b) amounts to 2 to 50% by weight of the total of components (a) and (b).

4,049,868

ABRASION-RESISTANT OPTICAL ELEMENT

Bernard L. Laurin, Ludlow; Don H. Rotenberg, Westboro, both of Mass., and Harry D. Crandon, Woodstock, Conn., assignors to American Optical Corporation, Southbridge, Mass.

Filed Dec. 29, 1975, Ser. No. 644,710
Int. Cl.[2] G02B 1/10, 1/04; B32B 27/08, 23/08
U.S. Cl. 428—412 4 Claims

1. An optical element with a transparent, abrasion-resistant surface comprising:

a transparent base of a synthetic organic polymeric material;

an adhesion-promoting coating on said transparent base;

an abrasion-resistant surface coating comprising a cured polysilicic acid ester of an alcohol containing from 1 to 12 carbon atoms, said ester having up to four silicic acid ester groups per silicon atom, a hydrolyzed vinyl polymer, a surface active agent and a cross-linking agent selected from the group consisting of formaldehyde, zirconyl nitrate, and mixtures thereof.

4,049,869

METHOD FOR PRESERVING POROUS INORGANIC SUBSTRATES

Charles F. De Long, Washington, D.C., assignor to United States Trading International, Inc., Washington, D.C.

Filed Sept. 19, 1975, Ser. No. 614,924
Int. Cl.[2] B05D 7/24; B32B 13/12, 3/00
U.S. Cl. 428—413 26 Claims

1. A method for preserving porous inorganic substrates consisting of applying to the porous inorganic substrate a gas and vapor permeable preservative composition consisting of an aqueous solution or dispersion of a carboxylated hydrophilic acrylic copolymer containing monomer units from at least one C_1–C_4 alkyl acrylate or methacrylate and about 5 to about 20% by weight of at least one carboxylic monomer, a cross-linking

agent for the carboxylated hydrophilic acrylic copolymer constituting from about 1.0 to about 10% by weight of the aqueous solution or dispersion and from about 0.1 to about 2.0% by weight of said aqueous solution or dispersion of an ultra-violet absorbing agent.

4,049,870

BACKCOATING OF POLYPROPYLENE FABRIC

George Brodmann, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 22, 1975, Ser. No. 643,424
Int. Cl.[2] B05D *3/02*
U.S. Cl. 428—424 5 Claims

1. A method of backcoating polypropylene fabric by applying to one surface of the fabric a coating composition comprising polymer and solvent, said polymer being a solid high molecular weight 1,1,1-trichloroethane soluble polymer containing at least 50 weight percent of poly(vinyl chloride/vinylidene chloride) copolymer and said solvent consisting essentially of 1,1,1-trichloroethane; thereafter, affixing the polymer by volatilizing the solvent from the fabric.

4,049,871

MAGNETIC RECORDING MATERIAL

Hiroshi Ogawa; Yasuo Tamai, both of Odawara, and Tutomu Nishina, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 498,671, Aug. 19, 1974, abandoned. This application Apr. 22, 1976, Ser. No. 679,287
Claims priority, application Japan, Aug. 17, 1973, 48-92114
Int. Cl.[2] H01F *10/02*
U.S. Cl. 428—425 9 Claims

1. A magnetic material comprising a non-magnetic substrate having a magnetic recording layer thereon which comprises a finely divided ferromagnetic material dispersed in a binder, said binder comprising:

1. a polyurethane resin which comprises a polyester-polyurethane resin;
2. a modified alkyd resin having an acid value of not higher than about 15, consisting of about 20 to 50% by weight polycarboxylic acid, about 10 to 30% by weight polyhydric alcohol, and about 20 to 60% by weight modifiers, said modifiers being natural oils selected from the group consisting of soya oil, linseed oil, tung oil, castor oil, dehydrated castor oil, coconut oil, safflower oil, sesame seed oil, fish oil, walnut oil, oiticica oil or cotton seed oil;
3. and a polyisocyanate compound, said ferromagnetic powder being employed in a weight ratio of 100:10 to 100:200 to said binder; said alkyd resin, said polyurethane resin and said polyisocyanate compound being employed in weight ratios of about 90:10 to 10:90 for said alkyd resin to said polyurethane resin, and about 95:5 to 60:40 for the sum of the weight of said alkyd resin and said polyurethane resin to said polyisocyanate compound.

4,049,872

GLASS FRIT COMPOSITION FOR SEALING WINDOW GLASS

Kenneth Warren Hang, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 12, 1976, Ser. No. 704,325
Int. Cl.[2] C03C *3/22, 3/14;* B32B *17/06*
U.S. Cl. 428—427 7 Claims

1. A devitrifiable glass frit consisting essentially by weight on an oxide basis of about 10–20% BaO, 10–11% Li_2O, 2–7% Al_2O_3, and 66–77% B_2O_3.

4,049,873

SURFACE TREATING COMPOSITIONS

Norman Geoffrey Creasey, and Leslie Clark Pike, both of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 24, 1975, Ser. No. 644,199
Claims priority, application United Kingdom, Jan. 28, 1975, 3592/75; July 23, 1975, 30843/75
Int. Cl.[2] B32B *9/04;* C08G *77/04;* C08L *43/04*
U.S. Cl. 428—447 10 Claims

1. An organopolysiloxane composition suitable for conferring release properties on substrates comprising 100 parts by weight of a linear diorganopolysiloxane in the form of a curable release composition and from 0.5 to 50 parts by weight based on the linear diorganopolysiloxane of a copolymer consisting essentially of the average general formula:

where A is selected from the group consisting of R, R^1Q, alkenyl and hydroxy groups and hydrogen, Q is oxygen or sulphur, R is selected from the group consisting of (a) alkyl, aryl, alkaryl, aralkyl and cycloalkyl groups, (b) groups $—R^2QR^3$ where R^2 is a divalent organic group having at least 2 carbon atoms and is joined to silicon by a C-Si linkage and R^3 is a monovalent hydrocarbon group and (c) hydrocarbonoxy groups joined to silicon by a C-Si linkage, R^1 is a hydrocarbon or hydrocarbonoxy group, *a* and *d*, which will not normally be the same, are 0 or numbers not greater than 950, *b* is 0 or a number not greater than 999 and *c* is a number from 1 to 1000, $a + b + c + d$ is not less than 20 and not greater than 1000, $(b + c)/(a + b + c + d)$ is not less than 0.05, at least one of the groups R and R^1 being an alkyl group of 8 to 30 carbon atoms, the proportion of said copolymer in the composition being sufficient to provide at least one of said alkyl groups for each 2000 silicon atoms in the composition.

4,049,874

PROCESS FOR PRODUCING AN ARCHITECTURAL PRECAST CONCRETE PANEL

Tsuyoshi Aoyama, Hoya; Yoshimasa Hayashi, Tokyo; Michio Nagano, Urawa, and Hiroshi Nagase, Tokyo, all of Japan, assignors to Fujikura Kasei Co., Ltd., Japan

Continuation-in-part of Ser. No. 592,938, July 3, 1975, abandoned, which is a continuation of Ser. No. 455,504, March 27, 1974, abandoned. This application Jan. 14, 1976, Ser. No. 648,898
Claims priority, application Japan, Aug. 1, 1973, 48-86624
Int. Cl.[2] B32B *13/12;* B28B *1/16*
U.S. Cl. 428—451 8 Claims

1. A process for producing a decorative precast concrete panel for an outside wall, which comprises mixing about 100 parts by weight of viscous methyl methacrylate syrup with from about 0.5 to about 15 parts by weight of a radical polymerizable cross-linking monomer having α, β-unsaturated groups to obtain a thermosetting acrylic resin solution, mixing about 100 parts by weight of said resin solution with from about 0.01 to about 1.0 part by weight of a redox type polymerization initiator and from about 300 to about 700 parts by weight of aggregates to form a mixture, molding the said mixture into a shape, then placing a hydraulic cement composition on the surface of the said mixture while the said mixture is in a nonpolymerized state, performing simultaneously the polymerization of said resin and hydration of said hydraulic cement composition, whereby said mixture is formed into molded substances in one body as a concrete panel for outside walls resistant to weathering.

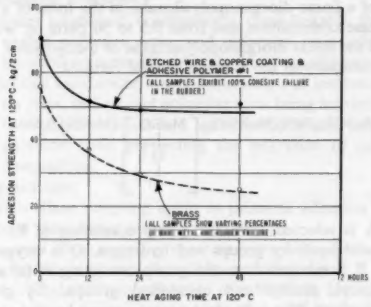
8. A decorative precast concrete panel for an outside wall produced by the process defined in claim 1.

4,049,875

BONDING RUBBER TO FERROUS METAL THROUGH A DEPOSIT OF COPPER AND ADHESIVE AND LAMINATE THEREFROM

Dennis L. Edie, Kobe, Japan, assignor to Honny Chemicals Company, Ltd., Kobe, Japan

Filed Sept. 5, 1975, Ser. No. 610,695
Claims priority, application Japan, Sept. 14, 1974, 49-106505
Int. Cl.² B32B *15/06*
U.S. Cl. 428—462 **27 Claims**


ETCHED WIRE & COPPER COATING & ADHESIVE POLYMER #1
(ALL SAMPLES EXHIBIT 100% COHESIVE FAILURE IN THE RUBBER)
BRASS
(ALL SAMPLES SHOW VARYING PERCENTAGES OF BRASS METAL AND RUBBER FAILURE)
ADHESION STRENGTH AT 120°C - kg/2cm
HEAT AGING TIME AT 120° C
HOURS

1. A laminated article comprising a ferrous metal substrate having a lossely adherent deposit of copper thereon, a layer of adhesive over said copper and rubber bonded through said copper and adhesive to said ferrous metal substrate, said adhesive consisting essentially of an interpolymer containing about 50 to about 99% by weight of a conjugated diene, about 1–45% by weight of a heterocyclic base and 0 to about 40% by weight of at least one additional monomer copolymerized therewith.

13. A process for bonding rubber to a ferrous metal substrate which comprises depositing a loosely adherent layer of copper on said ferrous metal substrate, applying an adhesive thereover, said adhesive consisting essentially of an interpolymer containing about 50 to about 99% by weight of a conjugated diene, about 1–45% by weight of a heterocyclic base and 0 to about 40% by weight of at least one additional monomer copolymerized therewith, thereafter contacting said adhesive with the rubber to be bonded and bonding by heat and pressure.

4,049,876

CEMENTED CARBONITRIDE ALLOYS

Takaharu Yamamoto; Toshio Nomura; Tsuyoshi Asai, and Akio Hara, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 620,853, Oct. 8, 1975, abandoned. This application Nov. 18, 1976, Ser. No. 743,212
Claims priority, application Japan, Oct. 18, 1974, 49-120734; Oct. 18, 1974, 49-120735; Oct. 18, 1974, 49-120736; Oct. 18, 1974, 49-120737; Oct. 18, 1974, 49-120738; Feb. 26, 1975, 50-24357; Feb. 27, 1975, 50-24587
Int. Cl.² B22F *3/00*; C22C *29/00*
U.S. Cl. 428—932 **11 Claims**

1. A cemented carbonitride alloy having a hard phase consisting essentially of $[(\text{Group IVa metal})_A(\text{Group Va metal})_B(\text{Group VIa metal})_C](C_XN_Y)_Z$, wherein *A, B, C, X* and *Y* represent mole fractions, *Z* is the mole ratio of the metalloid components to the metal components, and *A, B, C, X, Y* and *Z* satisfy the equations

$$A + B + C = 1,$$

$$X + Y = 1,$$

$$4A + 5B + 6C + 4XZ + 5YZ \geqq 8.6,$$

$$0.05 \leqq Y \leqq 0.50 \text{ and } 0.85 \leqq Z \leqq 1.0,$$

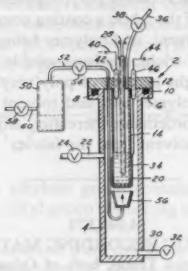
and wherein the hard phase is combined by at least one binder metal selected from the group consisting of iron, cobalt and nickel and there are in the alloy structure WC phase and the hard phase having a B1 crystal structure and containing Ti in a proportion of at least 20 atomic percent to the metallic atoms.

4,049,877

THERMOELECTRIC GENERATOR

Roger B. Saillant, and Neill Weber, both of Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 17, 1975, Ser. No. 614,289
Int. Cl.² H01M *6/36*
U.S. Cl. 429—11 **22 Claims**



1. In a thermoelectric generator wherein heat energy is converted to electrical energy and which comprises

1. enclosure means for a first reaction zone;
2. enclosure means for a second reaction zone;
3. a reaction zone separator which
   a. separates and essentially completes enclosure of said first reaction zone and said second reaction zone and
   b. comprises a cationically-conductive, solid electrolyte that is essentially impermeable to elemental alkali metal and compounds thereof and ionically conductive with respect to cations of said alkali metal;
4. alkali metal within said first reaction zone and in fluid communication with said solid electrolyte;
5. an electrode within said second reaction zone in electrical contact with said solid electrolyte and sufficiently porous to permit alkali metal to pass therethrough;
6. conduction means for electron flow between said alkali metal within said first reaction zone and said electrode in said second reaction zone;
7. inlet means for introducing said alkali metal into said first reaction zone; and
8. temperature control means adapted to maintain a temperature in said first reaction zone at least 100° C in excess of the lowest temperature in said second reaction zone,

wherein the improvement comprises employing as said electrode a porous film of a metal which is selected from the group consisting of molybdenum, tungsten, chromium, nickel and iron, said film having been deposited on said reaction zone separator in a thickness of between about 0.5 and about 10 micrometers by chemical vapor deposition.

10. In a process for manufacturing a thermoelectric generator wherein heat energy is converted to electrical energy, which device comprises

1. enclosure means for a first reaction zone;
2. enclosure means for a second reaction zone;
3. a reaction zone separator which
   a. separates and essentially completes enclosure of said first reaction zone and said second reaction zone and
   b. comprises a cationically-conductive, solid electrolyte that is essentially impermeable to elemental alkali metal and compounds thereof and ionically conductive with respect to cations of said alkali metal;

4. alkali metal with said first reaction zone and in fluid communication with said solid electrolyte;
5. an electrode with said second reaction zone in electrical contact with said solid electrolyte and sufficiently porous to permit alkali metal to pass therethrough;
6. conduction means for electron flow between said alkali metal within said first reaction zone and said electrode in said second reaction zone;
7. inlet means for introducing said alkali metal into said first reaction zone; and
8. temperature control means adapted to maintain temperature in said first reaction zone at least 100° C in excess of the lowest temperature in said second reaction zone,

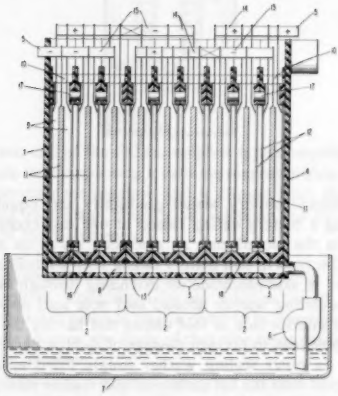
wherein the improvement comprises forming said electrode in electrical contact with said solid electrolyte by depositing a porous film of a metal in a thickness of between about 0.5 and about 10 micrometers by thermally decomposing a vapor phase carbonyl of said metal, said metal being selected from the group consisting of molybdenum, tungsten, chromium, nickel and iron.

4,049,878

ELECTROCHEMICAL BATTERY

Olle Birger Lindstrom, Lorensviksv. 14, 183 63 Taby, Sweden

Filed May 12, 1976, Ser. No. 685,647
Claims priority, application Sweden, May 12, 1975, 7505447
Int. Cl.² H01M *2/40*
U.S. Cl. 429—18 **3 Claims**



1. An electrochemical battery comprising:

frame means;

at least two modules mounted in said frame means electrically interconnected in series, each module containing at least two cells electrically connected in parallel, each cell comprising:

at least one positive electrode,

a negative electrode, and

an electrolyte space therebetween; and

an electrolyte supply bi-channel connected to each electrolyte space independently of an adjacent space to supply each electrolyte space individually with electrolyte from a source of electrolyte,

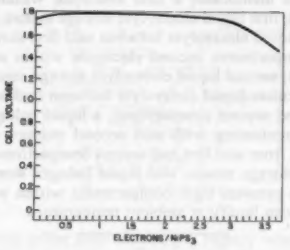
the electrolyte spaces of each module being interconnected fluidly in parallel at their lower ends by cross-channels to enable electrolyte to be transferred between said spaces.

4,049,879

INTERCALATED TRANSITION METAL PHOSPHORUS TRISULFIDES

Arthur H. Thompson, New Providence, and M. Stanley Whittingham, Fanwood, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Apr. 19, 1976, Ser. No. 677,889
Int. Cl.² H01M *10/00*
U.S. Cl. 429—191 **25 Claims**



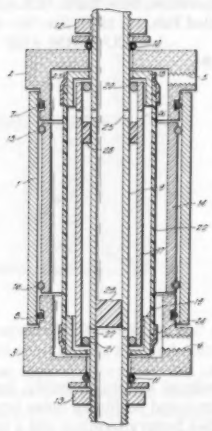
1. An electrochemical cell in the charged state comprising: an anode consisting essentially of an anodeactive material selected from the group consisting of alkali metals, magnesium, calcium, aluminum, and zinc and combinations thereof; a cathode consisting essentially of a transition metal phosphorus trisulfide corresponding to the formula $M(PS_3)_y$ wherein M is at least one transition metal selected from the group consisting of iron and nickel and y is a numerical value between about 0.9 and 1.0; and an electrolyte that is inert to the anode and the cathode and allows the passage of ions of the anode-active material to pass from the one electrode to the other.

4,049,880

SELF-GENERATING HALOGEN LIQUIFICATION IN A SECONDARY BATTERY

Thomas G. Hart, Royal Oak, Mich., assignor to Energy Development Associates, Madison Heights, Mich.

Filed June 11, 1976, Ser. No. 695,247
Int. Cl.² H01M *10/00*
U.S. Cl. 429—49 **12 Claims**



1. In the method of storing halogen generated during the charging phase of a rechargeable battery for use during the discharging phase thereof, said battery employing a halide containing electrolyte and electrodes for the cation and halogen, the improvement which comprises separating the elec-

trodes by a cation permselective membrane, furnishing halide containing electrolyte to the electrode for the cation and electrode for the halogen in separate but pressure balanced flows, transporting the halogen gas generated during charging to a pressure tight area maintained apart from the electrodes, and allowing the halogen gas to liquify at ambient temperature under the autogenuous pressure developed and without external pressure control.

9. A halide rechargeable battery comprising a first and second electrode compartments separated by a common cation permselective membrane; a first electrode within said first compartment; first liquid electrolyte storage means; first means to circulate liquid electrolyte between said first storage means and first compartment; second electrode within said second compartment; second liquid electrolyte storage means; second means to circulate liquid electrolyte between said second storage means and second compartment; a liquid halogen storage means communicating with said second storage means and located apart from said first and second compartments and first and second storage means, said liquid halogen storage means comprising a pressure tight compartment within which gaseous halogen can liquify at ambient temperature.

4,049,881

SOLID ELECTROLYTE COMPOSITION AND CELL

Bhaskara M. L. Rao, Fanwood, and Bernard G. Silbernagel, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Jan. 18, 1977, Ser. No. 760,341
Int. Cl.[2] H01M *10/44*
U.S. Cl. 429—50 **25 Claims**

1. A solid electrolyte composition, comprising one or more compounds of the formula:

$$LiI{\cdot}x]Al_2(SO_4)_3{\cdot}nH_2O]$$

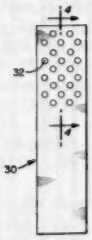
wherein x is the number of moles of $Al_2(SO_4)_3{\cdot}nH_2O$ per mole of LiI, and wherein n is the number of moles of H_2O per mole of $Al_2(SO_4)_3$, subject to the proviso that x is a numerical value from about 0.05 to about 5, and n is a numerical value from 0 to about 20.

4,049,882

BATTERY ASSEMBLY

Theodore Robert Beatty, Cleveland, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 11, 1976, Ser. No. 657,204
Int. Cl.[2] H01M *4/00*
U.S. Cl. 429—94 **8 Claims**



1. In a cylindrical battery assembly, including at least one galvanic cell enclosed within an outer housing having a positive and negative battery terminal and a supply of electrolyte, comprising:

a strip of negative electrode material composed of a conductive metal and electrochemically active material;

a strip of positive electrode material;

a porous separating member for maintaining the positive and negative electrode strips spaced from one another, with the strip of positive and negative electrode material being spirally wound in combination with said porous separating member into a cylindrical form; and

means for electrically coupling said positive and negative strip of electrode material to the corresponding positive and negative terminal of said outer housing, the improvement comprising;

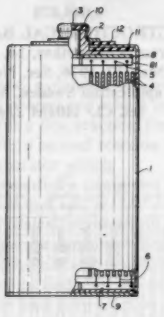
wherein said means for electrically coupling at least said negative strip of electrode material to its corresponding housing terminal comprises at least one conductive element having a multiplicity of projections which penetrate into said electrode for mechanically joining said element to said electrode and for simultaneously establishing electrical contact with said conductive metal in said strip of negative electrode through the mechanical points of contact provided by said projections.

4,049,883

GAS- AND LIQUID-TIGHT STORAGE BATTERY

Gerd Schenk, Iserlohn, and Heinz Haake, Breckerfeld, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed July 21, 1976, Ser. No. 707,284
Claims priority, application Germany, Sept. 24, 1975, 2542459
Int. Cl.[2] H01M *10/34*
U.S. Cl. 429—94 **5 Claims**



1. A storage battery sealed gas-tightly and liquid tightly comprising a battery casing closed at one end except for an opening in the closed end, an electrode set as an electrode winding disposed in said battery casing with a terminal post as a pole lead of said electrode set extending through said opening, an insulating washer around said pole lead disposed between the interior side of said casing end having the opening and said pole lead to prevent passage of electric current therebetween, an outer sealing washer snugly fitted around said terminal post with the flat surface of said washer resting on the metal wall forming said opening and a terminal post cap placed on said terminal post with said cap pressing against and holding said washer in place as sealing means to make said opening electrolyte-tight and prevent leakage of electrolyte therethrough, a contact disk connected to electrodes of one polarity of said electrode winding with said contact disk attached to said terminal post, and a welded-on bottom disk connected to electrodes of the other polarity of said electrode winding, on the opposite full opening of said battery casing to electrolyte-tightly and gas-tightly seal said opposite end of the battery casing.

4. A method of producing a storage battery sealed gas-tightly and liquid-tightly which comprises forming a battery casing having a full opening at one end and closed at the opposite end except for an opening in the closed end, inserting through said full opening of said battery casing an electrode set having a hollow terminal post and having an insulating washer around said post, to bring the post through said opening and

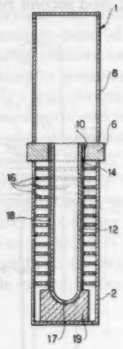
insulate said post from the metal wall forming the opening, welding a bottom disk to the battery casing at the full opening to provide an electrolyte-tight and gas-tight closure, injecting electrolyte through said hollow terminal post into said battery casing, inserting pressure release means in said hollow terminal post, placing a sealing washer around the outside diameter of the hollow terminal post with the flat surface of said washer resting on said metal wall forming the opening and snugly fitted around the terminal post, and pressing a terminal post cap onto said terminal post to secure said pressure release means and said sealing washer.

4,049,884

SODIUM-SULPHUR ELECTRIC CELL

Gérard Desplanches, Villejust; Yvon Lazennec, St Michel sur Orge, and Alain Wicker, Limours, all of France, assignors to Compagnie Generale d'Electricite S.A., Paris Cedex, France

Filed Apr. 8, 1976, Ser. No. 675,005
Claims priority, application France, Apr. 24, 1975, 75.12853
Int. Cl.[2] H01M *10/39*
U.S. Cl. 429—104 **12 Claims**



1. Electric cell of the sodium-sulphur type comprising:

a cathode tank containing a cathode reagent which is liquid at operating temperature and is chosen from the group formed by sulphur, phosphorus, selenium and the alkaline salts of those elements;

at least one tube of solid electrolyte closed at its lower end, containing an anode reagent which is liquid at operating temperature, constituted by an alkaline metal and arranged in said cathode tank in order to be immersed in said cathode reagent, the walls of that tube being made of beta alkaline alumina;

a support made of a ceramic insulating material, for holding said electrolyte tube in said cathode tank, the connection between that support and that tube being provided by means of a glass part;

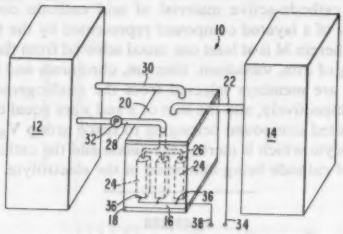
an anode tank containing a supply of said anode reagent and arranged above said cathode tank, so that said electrolyte tube opens at its upper part into that anode tank, said support separating the open ends of said anode tank and of said cathode tank, the said cathode tank being fitted with washers made of graphite felt ensuring the cathode collection of the current generated, that cell being characterized in that on the one hand, the outside face of said electrolyte tube, with the exception of its lower end comprises a porous coating which is electronically insulating and is intended to insulate said washers from said electrolyte tube and that on the other hand, a part made of graphite felt is arranged between said lower end of the electrolyte tube and the bottom of said cathode tank.

4,049,885

CONSTRUCTION FOR SOLID ELECTROLYTE IN SODIUM/SULFUR BATTERY

Stephen Paul Mitoff, Clifton Park, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 12, 1976, Ser. No. 731,170
Int. Cl.[2] H01M *6/18*
U.S. Cl. 429—104 **6 Claims**



1. A sodium-sulfur solid electrolyte battery wherein sodium is the negative electrode reactant and sulfur is the positive electrode reactant comprising:

a ceramic block having a plurality of parallel half-cells in spaced-apart planes in a first direction for negative electrode reactant and in a second direction normal to said first direction for positive electrode reactant;

means connected to said negative electrode half-cell for introducing negative electrode reactant into said negative electrode half-cell;

means connected to said positive electrode half-cell for circulating positive electrode reactant through said positive electrode half-cell; and

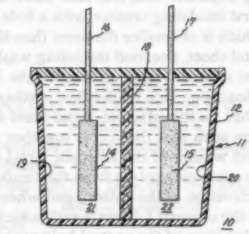
means for collecting current from said positive electrode reactant in said positive electrode half-cell.

4,049,886

RECHARGEABLE AQUEOUS METAL-HALOGEN CELL

Fritz G. Will, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 13, 1976, Ser. No. 750,271
Int. Cl.[2] H01M *10/24*
U.S. Cl. 429—105 **6 Claims**



1. A rechargeable aqueous metal-halogen cell comprising a casing, a pair of spaced apart porous electrode substrates in the casing, a micro-porous separator between the electrode substrates defining a positive and a negative electrode compartment, an aqueous electrolytic solution containing a zinc salt selected from the class consisting of zinc bromide, zinc iodide and mixtures thereof in both compartments, and an organic halogen complexing additive of nitrobenzene in the electrolytic solution of at least the positive electrode compartment, the additive present in an amount from 1 to 90 weight percent of the electrolytic solution.

4,049,887

ELECTROCHEMICAL CELLS WITH CATHODE-ACTIVE MATERIALS OF LAYERED COMPOUNDS

M. Stanley Whittingham, Fanwood, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed July 20, 1976, Ser. No. 707,091
Int. Cl.[2] H01M 6/36
U.S. Cl. 429—112 **8 Claims**

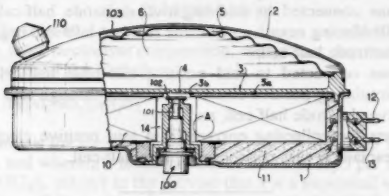
1. An electrochemical cell comprising an anode and cathode; the cathode-active material of said cathode consisting essentially of a layered compound represented by the formula MA_xB_y wherein M is at least one metal selected from the group consisting of iron, vanadium, titanium, chromium and indium, A and B are members selected from the chalcogenides and halides, respectively, and the sum of x and y are equal to about 2, the layered compound belonging to space group V_H^{13}; and, an electrolyte which is inert to the anode and the cathode, the anode and cathode being immersed in the electrolyte.

4,049,888

CENTRALLY-ACTIVATED DEFERRED-ACTION SILVER-ZINC BATTERY

Jacques Flender, Le Raincy, France, assignor to SAFT-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Jan. 27, 1977, Ser. No. 763,098
Claims priority, application France, Oct. 13, 1976, 76.30745
Int. Cl.[2] H01M 6/38
U.S. Cl. 429—115 **11 Claims**



1. A centrally activated deferred-action battery comprising a stack of couples each constituted by a positive plate and a negative plate and separators each having a central hole forming a central well, means spacing said plates from each other to provide a gap between adjacent facing positive and negative plates for receiving electrolyte, means mechanically separating each couple from the adjacent couple, a metal sheet electrically connecting adjacent couples, said sheet also having a central hole, a first insulating washer with a hole in the center of the washer which is of smaller diameter than the hole in the center of the metal sheet, a second insulating washer cooperating with said first named washer to insulate the inner edge of the said metal sheet, one face of the first washer resting on a said second washer on the adjacent metal sheet and including at least one recess such that the recess together with the said last-named second washer of the adjacent metal sheet forms a channel for conveying electrolyte from the central well to the said gap upon activation of the battery and wherein the recess is so shaped that the channel follows a path which is oblique to the local radial direction of the central hole of said first named washer.

4,049,889

HERMETICALLY SEALED ALKALI METAL BATTERY CONTAINER

Walter K. Heintz, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 1, 1976, Ser. No. 719,881
Int. Cl.[2] H01M 2/02
U.S. Cl. 429—174 **4 Claims**

1. A hermetically sealed alkali metal battery container comprising:

a ceramic ring having top and bottom surfaces;

an inner casing of a solid alkali ion-conductive material with one open end;

a glass seal sealing said inner casing adjacent its open end to said ceramic ring so that said inner casing extends downwardly from the bottom surface of said ceramic ring;

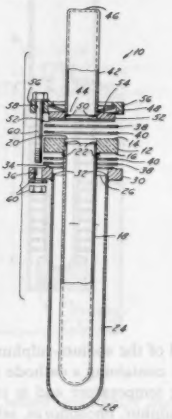
a first outer casing with an open end and a closed end, said outer casing surrounding said inner casing and spaced therefrom;

a first ring encircling and bonded to said open end of said first outer casing, said ring (a) having a raised annular ridge encircling said open end of said first outer casing, (b) having at least a pair of openings for receiving bolts therethrough, and (c) being adjacent said bottom surface of said ceramic ring;

a first pair of thin washers positioned between said raised annular ridge of said first ring and said bottom surface of said ceramic ring, said washer adjacent said first ring having a coefficient of thermal expansion closely matching that of said first ring and said washer adjacent said ceramic ring having a coefficient of thermal expansion closely matching that of said ceramic ring;

a second outer casing with an open end and a closed end;

a second ring encircling and bonded to said open end of said second outer casing, said second ring (a) having a raised



annular ridge encircling said open end of said second outer casing, and (b) being adjacent said top surface of said ceramic ring, whereby said second outer casing is spaced from and extends in an opposite direction to said first outer casing;

a second pair of thin washers positioned between said raised annular ridge of said second ring and said top surface of said ceramic ring, said washer adjacent said second ring having a coefficient of thermal expansion closely matching that of said second ring and said washer adjacent said ceramic having a coefficient of thermal expansion closely matching that of said ceramic ring;

a Belleville spring encircling said second outer casing and engaging an upper surface of said second ring;

a third ring encircling said second outer casing and both (a) engaging an upper edge of said Belleville spring, and (b) having at least a pair of spaced openings aligned with said openings of said first ring for receiving bolts therethrough; and

at least a pair of nut and bolt assemblies extending through said openings in said first and said third rings and securely tightened together to draw said annular ridges on said first and said second rings tightly into engagement with said first and said second pair of washers to provide a hermetically sealed alkali metal battery container.

4,049,890

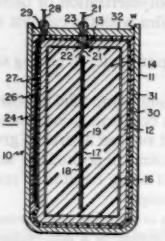
LITHIUM-IODINE CELLS AND METHOD FOR MAKING SAME

Alan A. Schneider, Reisters Town, Md., assignor to Catalyst Research Corporation, Baltimore, Md.

Continuation of Ser. No. 564,755, April 3, 1975, abandoned. This application July 26, 1976, Ser. No. 708,915

Int. Cl.[2] H01M *6/18*

U.S. Cl. 429—181 4 Claims



1. A lithium iodine primary cell comprising a lithium anode encasing member, a cathode material positioned within and filling said anode encasing member and consisting essentially of an organic charge transfer complex and iodine; a cathode current collector having a lead portion coated with an insulating material, said insulated portion extending from said collector to a first terminal and being embedded within a portion of the anode encasing member; a lithium iodine electrolyte coextensively positioned between and in contact with the entire inner surface of said anode encasing member and said cathode material; an anode current collector; and first and second terminals, said first terminal being in electrical contact with said cathode lead and said second terminal being in electrical contact with said anode current collector.

4,049,891

COMPOSITIONS FOR FAST ALKALI-METAL-ION TRANSPORT

Henry Y-P Hong, Westford, and John B. Goodenough, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed June 21, 1976, Ser. No. 697,803

Int. Cl.[2] H01M *12/00;* C01B *15/16, 33/32*

U.S. Cl. 429—193 8 Claims

1. A crystalline compound which promotes fast alkali metal-ion transport in three dimensions having the formula selected from the group consisting of:

$$A_nX_2(ZO_4)_3$$

and

$$A_m(Z'_2O_4)_3$$

wherein A is potassium, sodium or lithium, Z is a tetrahedrally coordinated cations or mixtures thereof not reducible by molten alkali metal, X is an octahedrally coordinated cation or mixtues thereof not reducible by molten alkali metal, n is a number greater than 1 and less than 4, m is a number from 1 up to 2 and Z' comprises at least two Z cations.

4,049,892

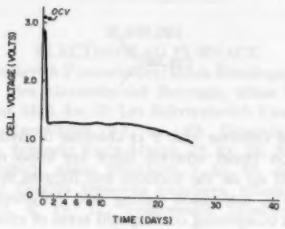
NON-AQUEOUS CELL HAVING AS CATHODE A MIXTURE OF LEAD DIOXIDE AND LEAD MONOXIDE AND/OR LEAD PARTICLES

Marvin Lee Kronenberg, Cleveland Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,362

Int. Cl.[2] H01M *6/14*

U.S. Cl. 429—194 30 Claims



1. A lead oxide cell comprising a highly active metal negative electrode, a positive electrode and a non-aqueous electrolyte comprising a salt dissolved in an organic solvent; said positive electrode comprising a substantially uniform mixture of lead dioxide and lead monoxide and said cell having a substantially unipotential discharge voltage.

12. A lead oxide cell comprising a highly active metal negative electrode, a positive electrode and a non-aqueous electrolyte comprising a salt dissolved in an organic solvent; said positive electrode comprising a substantially uniform mixture of lead dioxide and lead particles and said cell having a substantially unipotential discharge voltage.

22. A lead oxide cell comprising a highly active metal negative electrode, a positive electrode and a non-aqueous electrolyte comprising a salt dissolved in an organic solvent; said positive electrode comprising a substantially uniform mixture of lead dioxide, lead monoxide and lead particles; and said cell having a substantially unipotential discharge voltage.

4,049,893

HYDROGENATED WAXY OLEFIN AND PROCESS OF MAKING SAME

Louis E. Kidwell, Jr., Shreveport, La., assignor to Pennzoil Company, Houston, Tex.

Filed Apr. 25, 1975, Ser. No. 571,613

Int. Cl.[2] C08F *8/04*

U.S. Cl. 526—26 21 Claims

1. A process for the hydrogenation of waxy polyethylene olefins comprising reacting (a) a feed stock consisting of said waxy polyethylene alpha olefins, said alpha olefins having an average molecular weight in the range of 350 to 900, a normal straight chain hydrocarbon content of at least 45% and having at least 22 carbon atoms in at least 95% of the molecules of said alpha olefins with (b) a hydrogen affording gas in an amount sufficient to supply at least a stoichiometrical quantity of hydrogen to said feed stock by contacting said feed stock with said hydrogen-affording gas at pressures ranging from about 200 psig to about 1000 psig at hydrogenation temperatures below about 750° F in the presence of an active hydrogen catalyst.

4,049,894

LATEX MODIFIED PORTLAND CEMENT AND USE THEREOF IN POLYMERIZATION REACTORS

Richard Harold Backderf, Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 25, 1975, Ser. No. 607,628
Int. Cl.[2] C08F *2/18, 14/06, 14/08*
U.S. Cl. 526—62 12 Claims

1. In the aqueous polymerizatin of vinyl halide monomers having the structural formula

where X is chlorine and Y is chlorine or hydrogen, in a polymerization vessel wherein there are areas of excessive polymer build up on the surfaces and fixtures in said vessel exposed to the suspension during said polymerization, the improvement comprising coating said areas of excessive polymer build up prior to the polymerization reaction with a composition comprising portland cement and an aqueous dispersion containing up to about 65 weight percent of a polymer containing about 0.1 to 25 weight percent carbonyl groups and having a Tg° C. of less than 40° C., said polymer present in said composition in an amount less than about 10 weight parts per 100 weight parts of said composition.

4,049,895

REACTOR AND PROCESS FOR VINYL CHLORIDE POLYMERIZATION

Malcolm Peter McOnie, St. Albans, England; Anthony John Philip Tucker, Johannesburg, and Peter Willem van Lienden, Kempton Park, both of South Africa, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 2, 1976, Ser. No. 710,882
Claims priority, application United Kingdom, Aug. 26, 1975, 35207/75; July 12, 1976, 28842/76
Int. Cl.[2] C08F *2/18, 14/06*
U.S. Cl. 526—62 6 Claims

1. A process for the production of a vinyl chloride polymer wherein vinyl chloride is homopolymerised or copolymerised in aqueous dispersion in a reactor having inside at least one polished surface provided by a layer constructed from a Cr/Ni stainless steel of Cr content 13–30 wt % and Ni content 20–35 wt %.

4,049,896

OLEFIN POLYMERIZATION CATALYST

Louis J. Rekers, Wyoming; Stanley J. Katzen, and Jerome H. Krekeler, both of Cincinnati, all of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Division of Ser. No. 558,504, March 14, 1975, Pat. No. 3,984,351. This application Aug. 20, 1976, Ser. No. 716,038
Int. Cl.[2] C08F *4/78, 10/00*
U.S. Cl. 526—129 3 Claims

1. A process for the polymerization of olefins which comprises contacting said olefins with the catalyst system comprising:

a. a solid inorganic support material having surface hydroxyl groups,

b. a chromium containing compound deposited on said support, said chromium containing compound being capable of reacting with said surface hydroxyl groups, and

c. an aluminum compound deposited on said support, said aluminum compound being capable of reacting with said surface hydroxyl groups,

said supported chromium containing compound and aluminum compound having been heated in a non-reducing atmosphere at a temperature above 300° C. up to the decomposition temperature of the support material and combined with a metallic or non-metallic reducing agent.

4,049,897

RESIDUAL SOLVENT REMOVAL FROM CHLORINATED POLYMERS

Ralph John Gilbert Houslay, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 13, 1976, Ser. No. 731,936
Claims priority, application United Kingdom, Nov. 7, 1975, 46207/75
Int. Cl.[2] C08C *3/02, 19/12;* C08F *6/00*
U.S. Cl. 528—483 6 Claims

1. A process for at least partly removing residual chlorinated hydrocarbon solvent from a chlorinated polymer obtained by precipitation from the said solvent, which process comprises treatment of the chlorinated polymer with the vapour of an aliphatic halo-hydrocarbon having a boiling point below that of the chlorinated hydrocarbon to be removed, the said treatment being carried out at a temperature of at least 10° C and which is at least 10° C above the boiling point of the halo-hydrocarbon employed in the treatment.

4,049,898

AMPHOTERICIN COMPLEXES CONTAINING OXALIC ACID AND CALCIUM

Julio Metzger, East Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 338,122, March 5, 1973, abandoned, which is a division of Ser. No. 203,037, Nov. 29, 1971, abandoned. This application Mar. 3, 1975, Ser. No. 555,015
Int. Cl.[2] C07H *17/08*
U.S. Cl. 536—17 4 Claims

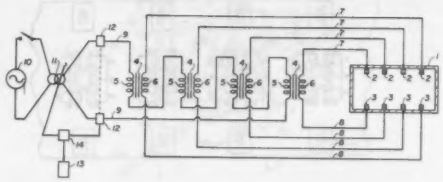
1. A crystalline amphotericin B complex comprising about 1 mol of amphotericin B, from about 0.5 to about 20 mols of an anion of oxalic acid, and from about 0.2 to about 0.8 mol calcium ion, the complex having a solubility in water at pH 2 of 3.44 g/l, an infrared absorption band at 6.1–6.3 microns, and an E_1^1 U. V. absorption value of 1500 at 405 millimicrons.

4,049,899

APPARATUS FOR UNIFORMLY HEATING MOLTEN GLASS

Hiroshi Shimizu, Moriyama; Jun Nishidai, Kyoto, and Toru Yasuta, Kusatsu, all of Japan, assignors to Nippon Electric Glass Company, Limited, Shiga, Japan

Filed June 14, 1976, Ser. No. 695,644
Claims priority, application Japan, June 17, 1975, 50-72698
Int. Cl.[2] C03B 5/02
U.S. Cl. 13—6 3 Claims



1. An apparatus for uniformly heating a material having an electrical resistance decreasing with an increase in the temperature of the material, which comprises

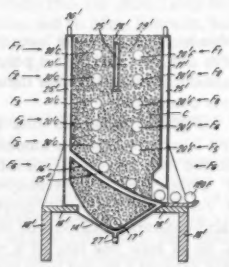
1. a container for the material,
2. a plurality of pairs of associated electrodes mounted in the container for passing an electric current between the electrodes of each pair and through the material in the container, and
3. a source of the electric current connected to each pair of electrodes, the current source including
   a. a like plurality of transformers each having a primary winding and a secondary winding, and
   b. a source of electric power, the primary windings being connected in series to the electric power source and each of the secondary windings being connected to an associated one of the pairs of electrodes whereby the transformers feed and control the electric current delivered to the pairs of electrodes to equalize the current regardless of electrical resistance variations in the material between the electrodes.

4,049,900

CONTINUOUS GRAPHITIZING FURNACE WITH A VERTICAL DISPLACEMENT OF THE CHARGE

Jean Louis Génevois, Milan, and Rolando Bufarale, Narni Scalo, both of Italy, assignors to Elettrocarbonium S.p.A., Milan, Italy

Filed May 26, 1976, Ser. No. 690,178
Claims priority, application Italy, May 26, 1975, 49789/75
Int. Cl.[2] H05B 3/60
U.S. Cl. 13—7 10 Claims



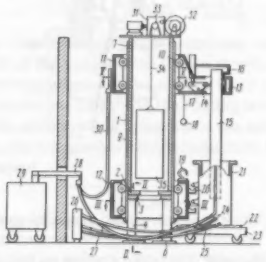
1. Continuous graphitizing furnace for carbon electrodes with vertical charge displacement, wherein the charge is formed by granulated insulating material and the electrodes to be graphitized comprising; an elongated hollow furnace body of a given deepness and defined by two side walls, two end walls and a concave bottom; a base for said body; a sloped grate crossing said hollow furnace body, having its upper part fixed to one wall of said defining walls and its lower part in the opposite wall; an exit opening formed along the entire base of said opposite wall; two head electrodes supported by the upper part of said end walls of the furnace; extracting means arranged in said concave bottom for extracting said granulated insulating material; and electrical connecting bars for electrically connecting the power transformer to said head electrodes.

4,049,901

ELECTROSLAG FURNACE

Andrei Grigorievich Pomeschikov, ulitsa Rimskogo-Korsa-kova, 10, kv. 2; Firs Alexandrovich Buryagin, ulitsa Nemirovicha-Danchenko, 18/1, kv. 39; Lev Seliverstovich Kazantsev, ulitsa Rimskogo-Korsa-kova, 11, kv. 69; Gennady Fedorovich Skvortsov, prospekt Karla Marxa, 25, kv. 26; Jury Anatolievich Naryshkin, ulitsa Bljukhera, 7, kv. 55, all of, Novosibirsk, and Zinaida Ivanovna Gracheva, oblasti, ulitsa Oktyabrskaya, 8, kv. 12, Voskresensk Moskovskoi, all of U.S.S.R.

Filed Feb. 23, 1976, Ser. No. 660,666
Int. Cl.[2] H05B 3/60
U.S. Cl. 13—9 ES 5 Claims



1. An electroslag furnace comprising: at least one pair of supports mounted on a foundation to provide a plurality of supports; a vertical column mounted on said supports substantially coaxially therewith, at least one pair of supports being spaced from each other on opposite sides of said vertical column to form a space under the same; guides secured to said supports and to said vertical column; a mould mounted on a bottom plate adjacent to said supports; an electrode holder mounted over said mould; an electrode holder carriage movable along said guides for displacing an electrode relative to said mould; a mould carriage movable along said guides along said supports; hoses of a cooling system extending in said space between said at least one pair of supports and below said column and connected to said mould and to said bottom plate; a plurality of current supply cables a number of which extend in said space between said at least one pair of supports and below said column and connected to the bottom plate and the balance of which are connected to said electrode holder carriage.

4,049,902

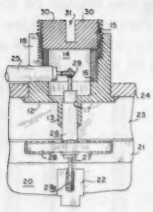
CONNECTOR FOR COAXIAL CABLES

Henry Marinus de Ronde, Lomita, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 24, 1975, Ser. No. 634,471
Int. Cl.[2] H01R 5/04; H05K 9/00
U.S. Cl. 174—35 C 9 Claims

8. Parts for forming an RF connector for connecting two coaxial cables, each cable having an external diameter of about 0.034 inch comprising

a cylindrical housing and threaded cap, said housing being open at one end and closed at the other by a base having a centered aperture of a diameter just sufficient to receive the inner conductor and insulation of one cable, said open end being internally threaded to receive said threaded cap, and said housing having a concentric extension of said base of an internal diameter just sufficient to receive the outer conductor of said one cable, said housing having an internal annular shoulder on said base and a slot through the side of the housing, said slot being longitudinally disposed and rounded at one end with a radius just half the diameter of the outer conductor of said other cable, said



shoulder being tangent to said rounded end of said slot, whereby said other cable may be inserted into said housing with its outer conductor resting on said shoulder, and

a sleeve of outer diameter just small enough to permit it being inserted into said housing, said sleeve having a length less than the distance from said shoulder to the open end of said housing, said sleeve having an open slot at one end, said one end thus being adapted to be inserted into said housing over said other cable, said open slot being rounded with a radius just sufficient to fit over the outer conductor of said other cable, the depth of said slot being not greater than the outside diameter of said outer conductor of said other cable, whereby said other cable is held in place against said shoulder when said cap is screwed in over said sleeve.

4,049,903

CIRCUIT FILM STRIP AND MANUFACTURING METHOD

Robert James Kobler, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 517,124, Oct. 23, 1974, abandoned. This application Apr. 15, 1976, Ser. No. 677,184

Int. Cl.[2] **H01B** *13/00;* **H05K** *1/04*

U.S. Cl. 174—68.5 **4 Claims**

1. Circuit film strip means comprising:

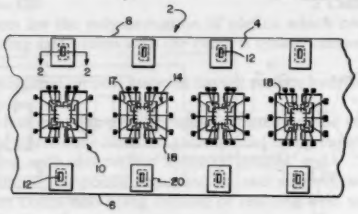
a continuous strip of insulating material, said strip having parallel side edges,

a row of spaced-apart punched holes in said strip extending along each of said side edges,

a layer of metal on one side of said strip in surrounding, and partially covering relationship to, each of said punched holes,

an etched sprocket hole in each of said layers of metal, each of said etched holes being centrally located over its associated punched hole and being smaller than its associated punched hole, and

repetitive spaced apart patterns of etched conductors between said side edges, said etched conductors and said etched sprocket holes having been formed in the same photo etching process by the use of a one mask means for said conductors and said sprocket holes so that each of



said patterns is in registry with at least two adjacent etched sprocket holes with the degree of precision of a photo resist printing and etching process whereby,

upon feeding said strip through a processing apparatus, each of said patterns will be located in said processing apparatus to the degree of precision of the photo resist printing and etching process.

4,049,904

PLASTIC LAMINATED METALLIC FOIL AND METHOD FOR PREPARING THE SAME

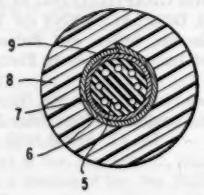
Yutaka Hori; Zenzo Honda; Kenji Suzuki; Keiji Nakamoto, and Yoshiharu Yamamoto, all of Toyohashi, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Division of Ser. No. 93,784, Nov. 30, 1970, abandoned. This application Oct. 24, 1972, Ser. No. 300,086

Claims priority, application Japan, Nov. 28, 1969, 44-95974; Jan. 30, 1970, 45-8637; Jan. 30, 1970, 45-8638

Int. Cl.[2] **H01B** *7/18;* **B32B** *7/02, 15/08*

U.S. Cl. 174—107 **26 Claims**



1. A plastic cable having a covering layer on the outside of its aggregated core and provided with a polyolefin jacket on the outer surface of the covering layer for the aggregated core, said covering layer comprising:

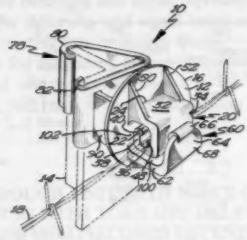
a. a metallic foil-plastic laminated film having adhered thereto a first layer comprising a ionomer of a base copolymer selected from the group consisting of ethylene-unsaturated carboxylic acid copolymers, ethylene-unsaturated carboxylic acid and ethylene-unsaturated carboxylic acid-unsaturated carboxylic acid ester ternary copolymers, on at least one side of a metallic foil and further having adhered a second layer comprising a polymer selected from the group consisting of ethylene-vinyl acetate copolymer or ethylene-unsaturated carboxylic acid ester copolymers, on the outside thereof, with the first layer being positioned between the metallic foil and the second layer.

4,049,905

INSULATOR FOR ELECTRIC FENCES

Melvin C. Maranell, St. Bonifacius, Minn., assignor to Sta-Tite Corporation, St. Bonifacius, Minn.

Filed Mar. 29, 1976, Ser. No. 671,336
Int. Cl.[2] H01B 17/16; A01K 3/00
U.S. Cl. 174—163 F 9 Claims



1. An insulator mountable on a fence post and capable of supporting and retaining an electrically conductive fence wire and withstanding repeated pushing and pulling on the fence wire by livestock without releasing the wire, comprising:

an insulator body formed of insulative material and including fence post mounting means for mounting said insulator body on the fence post;

said insulator body further including a face and an impact absorbing fence wire retaining hook fixed to and extending outwardly from the junction of said hook and said face and capable of receiving and retaining the fence wire therein, said hook being formed of elastically flexible material so as to be flexibly movable between a rest position adjacent said face and an extended position;

said insulator body further including a reinforcing member fixed to and extending outwardly from said face, said member being closely spaced from and confronting said wire retaining hook when said hook is in rest position and at least partially encompassing said hook;

said wire retaining hook contacting and bearing against said reinforcing member when said hook is in extended position and said hook and said reinforcing member cooperating to resist further movement of said hook toward said reinforcing member as force is applied to said hook by the wire when livestock exert force on the fence wires; and

said wire retaining hook having a generally spiral configuration and extending outwardly, cantileverly from said junction and then returning toward said junction, with the terminal end of said spiral configuration being closely spaced from said junction of said hook with said face.

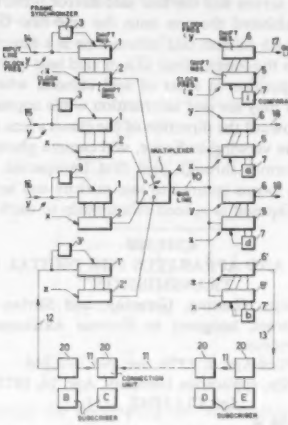
4,049,906

MESSAGE NETWORK FOR THE TRANSMISSION OF DIGITAL TELEGRAMS WITH AN ADDRESS CONSISTING OF ROUTING WORDS

E. Hafner, Wohlen, and H. Mey, Kehrsatz, both of Switzerland, assignors to Hasler AG, Bern, Switzerland

Filed Apr. 21, 1976, Ser. No. 679,074
Claims priority, application Switzerland, Apr. 25, 1975, 5346/75
Int. Cl.[2] H04L 11/12; H04Q 3/56
U.S. Cl. 178—2 C 8 Claims

1. A message network for the transmission of digital telegrams, comprising a plurality of switching stations (101–109) for the routing of said telegrams from any of said stations (101) on one of a plurality of selectable routes via any successive interconnected stations (101, 102, 103, 104), to any desired station (104), each of said telegrams including an address consisting of a logical stringing together of routing words (p,d,g,b) and said route being determined by the succession of the routing words of the address (*p/d/g/b*), in which in each station (101–109) each input line (14,15,16) is connected to an input store (1,2), for each output line (17,18,19) an output store (5,6) is provided and a routing word (*i,a,d*) is assigned, the routing words (*i,a,d*) associated with the output lines (17,18,19) of one station (104) being different from each other, in each station (101–109) the outputs of the input stores (1,2) are each connected to one of the inputs of a multiplexer (4), the inputs of the output stores (5,6) are connected to the output (10) of the multiplexer (4) and the output stores (5,6) are each connected to a comparator circuit (7;67;68) with a fixed value store (7;68)



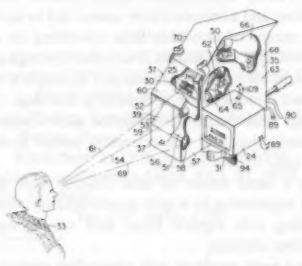
in which the routing word (*i,a,d*) associated with the output line (17,18,19) of the output store (5,6) is stored, in such a way that upon correspondence of the routing word (*i,a,d*) in one of the fixed value stores (7; 68) with the routing word at a specific location of the address of the telegram in the associated output store (5; 5.2), this telegram is transmittable onto the output line (17,18,19) thereof.

4,049,907

COMBINATION PHOTOGRAPHING AND PROMPTING SYSTEMS

James William Damon, P.O. Box 282, Bonner Springs, Kans. 66012

Filed Dec. 26, 1972, Ser. No. 318,597
Int. Cl.[2] H04N 5/645
U.S. Cl. 358—185 4 Claims



1. A combination photographing and prompting system for a performer including:

a pan-tilt head thereon,

a motion picture or television camera mounted on said pan-tilt head,

a prompter visual-information — displaying device unit mounted on said camera pan-tilt head combination, the screen of said prompter facing forwardly and disposed above the camera's lens,

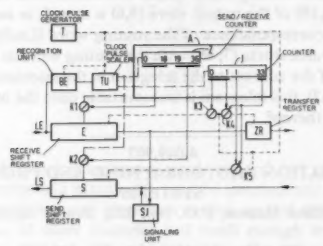
an image-reflecting periscope-like, two mirror system secured to said camera pan-tilt head combination, a transparent mirror or reflective transparent sheet of said system being disposed in front of said camera's lens at a substantial angle relative to the longitudinal axis thereof, the reflective surface used of said mirror facing away from

said lens, a second mirror or the like of said system secured to said camera pan-tilt head combination and disposed in front of the screen of said prompter at a substantial angle relative thereto, substantially parallel to the first mirror in substantial spaced relationship thereto, the reflective surface used of said second mirror facing and prompter screen and the first said mirror reflecting information exhibited thereon onto the said first transparent mirror which relfects said information in a direction about parallel to the longitudinal axis of said lens toward a performer's position in front of said camera, whereby said performer may see said information while appearing to be looking toward the direction of the camera lens and hence toward the viewing audience, said camera photographing said performer through said first transparent mirror, a mounting means secured to said mirrors and holding said mirrors disposed in spaced relationship to each other.

4,049,908
METHOD AND APPARATUS FOR DIGITAL DATA TRANSMISSION

Eberhard Knorpp, Gauting, Germany, and Silvian Schaffer, Dat-Yam, Israel, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 2, 1976, Ser. No. 673,344
Claims priority, application Germany, Apr. 14, 1975, 2516192
Int. Cl.² H04L *5/14*
U.S. Cl. 178—58 R **3 Claims**



1. A method of transmitting digital data in a time division multiplex (TDM) telecommunication system between subscriber stations and a concentrator connected to said subscriber stations by means of two-wire lines operating on a four-wire basis, wherein said digital data is coupled through time hybrid circuits at said subscriber stations and through a time hybrid circuit at said concentrator, comprising the steps of:

generating synchronizing pulses in said concentrator and communicating said synchronizing pulses to said concentrator time hybrid circuit,

initiating a send mode in said concentrator time hybrid circuit responsive to a said synchronizing pulse,

transmitting data signals from said concentrator to said subscriber stations,

initiating a send mode in said subscriber station concentrators responsive to reception of said data signals and to a predetermined characteristic of said data signals,

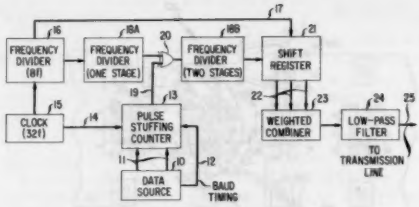
interposing receive pauses between each send mode and the subsequent receive mode in said concentrator time hybrid circuit and said subscriber station time hybrid circuits, each said receive pause having a duration equal to the maximum expected transit time for transmission over a said two-wire line between said concentrator and a said subscriber station, and

producing send pauses in said subscriber station hybrid circuits and inserting them between receive modes and subsequent send modes, said send pauses ending, at the earliest, with the appearance of said receive pauses in said concentrator time hybrid circuit.

4,049,909
DIGITAL MODULATOR

Richard John Peck, Eatontown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 29, 1975, Ser. No. 626,657
Int. Cl.² H04L *27/24*
U.S. Cl. 178—67 **7 Claims**



1. A modulator for differentially phase-encoded digital data comprising

multistage binary countdown means having an input wave oscillating at an integral multiple of a desired carrier frequency and an output wave at said carrier frequency,

multistage shift-register means driven by said output wave and shifted by said input wave from said countdown means,

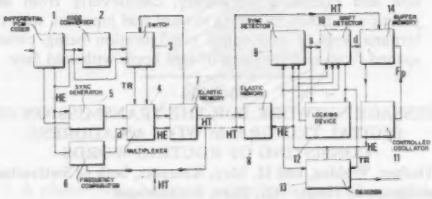
weighting means for combining a plurality of successive parallel outputs of said shift register means into quantized line signals at the desired carrier frequency, and

count inserting means responsive to the digital data for inserting extra counts into one or more preselected stages of said countdown means in accordance with a predetermined phase-shift data encoding.

4,049,910
DIGITAL SIGNAL TRANSMISSION SYSTEM

Jean-Claude Jolivet, Saint-Michel-en-Greve, and Francois-Xavier Stouls, Perros Guirec, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Mar. 30, 1976, Ser. No. 671,824
Claims priority, application France, Apr. 18, 1975, 75.12179
Int. Cl.² H04L *7/04*
U.S. Cl. 178—69.1 **2 Claims**



1. A transmission system of the kind for transmitting and receiving digital signals over a transmission line, said system comprising: for transmission, a code converter for coding said signals into variable length words according to their occurrence probabilities, the word rate being determined by an emission clock for establishing an emission frequency, a synchronising word generator operating at a frequency bound to said emission frequency, means for multiplexing words from the code converter and the synchronising word generator forming variable length words, and a first elastic memory connected between said multiplexing means and said transmission line, and for reception, a second elastic memory connected to said transmission line, reading on transmission and writing on reception being carried out at a rate determined by a transmission clock, means for detecting synchronising words at the output of said second elastic memory and a decoder for deriv-

ing digital signals from said variable length words from said second elastic memory, said system for transmission further comprising, for transmission, means for supplying to said multiplexing means a signal representative to the drift of said emission frequency with respect to a frequency bound to said transmission frequency, and, for reception, a controlled oscillator supplying a timing signal for reading said reception memory, means for detecting said signal representative of the drift, said means for detecting said signal being controlled by said means for detecting synchronising words;

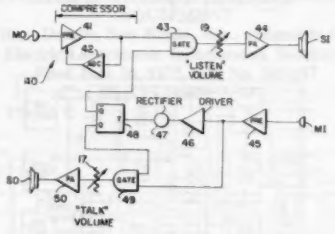
and means for recovering said emission frequency from said drift and said frequency bound to the transmission frequency, said recover means controlling said oscillator.

4,049,911

TALK-THROUGH UNIT WITH VOICE CONTROLLED SWITCHING WITH TURN OFF DELAY VARIABLE FROM 250–500 MILLISECONDS DEPENDING ON VOICE AMPLITUDE

Norman Schlaff, Brooklyn, and Mario Maltese, Williston Park, both of N.Y., assignors to Norcon Electronics Inc., Brooklyn, N.Y.

Filed Jan. 6, 1976, Ser. No. 646,918
Int. Cl.² H04M *9/10*
U.S. Cl. 179—1 H **4 Claims**



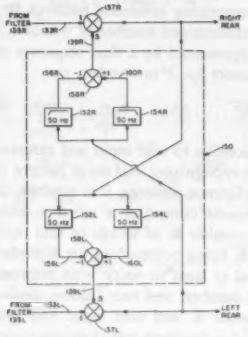
1. A self-contained, talk-through unit comprising a housing adapted for mounting on a partition, a first speaker and a first microphone contained in said housing and facing in a first direction, a second speaker and a second microphone contained in said housing and facing in an opposite direction, said housing including connecting means extending in said opposite direction with said second microphone being mounted at the end thereof at least several inches away from said second speaker, first amplifying means contained in said housing for amplifying a signal at said first microphone and for driving said second speaker, said first amplifying means including level-compression means for reducing variations in the output level of said second speaker in the presence of voice level variations in the vicinity of said first microphone, second amplifying means contained in said housing for amplifying a signal at said second microphone and for driving said first speaker, control means contained in said housing for normally enabling said first amplifying means and disabling said second amplifying means, sensing means contained in said housing responsive to the signal at said second microphone exceeding a pre-set threshold level for disabling said first amplifying means and for enabling said second amplifying means, means for holding said second amplifying means enabled and for holding said first amplifying means disabled for a fraction of a second ranging from 250 to 500 milliseconds even after the signal at said second microphone drops below said pre-set threshold level, said fraction of a second being proportional to the signal level at said second microphone during the operation of said sensing means, and battery means contained in said housing for powering said first and second amplifying means, said control means and said sensing means.

4,049,912

CHANNEL MIXER FOR MULTI-CHANNEL AUDIO SYSTEMS

Peter W. Mitchell, Charlestown, Mass., assignor to Audio Pulse, Inc., Bedford, Mass.

Filed Apr. 26, 1976, Ser. No. 680,474
Int. Cl.² H04R *5/00*
U.S. Cl. 179—1 GQ **11 Claims**



11. A circuit for distributing the information in two input signals into two outputs comprising:

first means responsive to at least a first one of said two input signals for providing a first output representation thereof in which signals in a predetermined range of frequencies are substantially inverted in phase with respect to other frequencies in said first output representation;

second means responsive to at least a second one of said two input signals for providing a second output representation in which signals in a predetermined range of frequencies are substantially inverted in phase with respect to other frequencies in said second output representation;

means for combining said first output representation with said second input signal to provide one of said two outputs;

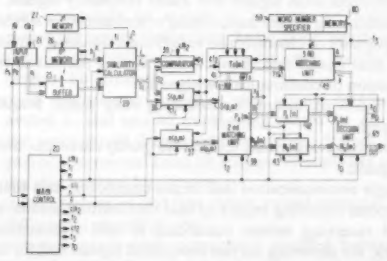
means for combining said second output representation into said first input signal to provide the other of said two outputs.

4,049,913

SYSTEM FOR RECOGNIZING SPEECH CONTINUOUSLY SPOKEN WITH NUMBER OF WORD OR WORDS PRESELECTED

Hiroaki Sakoe, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Nov. 1, 1976, Ser. No. 737,454
Claims priority, application Japan, Oct. 31, 1975, 50-132004; Feb. 20, 1976, 51-18346
Int. Cl.² G10L *1/00*
U.S. Cl. 179—1 SD **6 Claims**



1. In a continuous speech recognition system comprising an

input pattern buffer memory for temporarily memorizing an input pattern A represented by a time sequence of input pattern feature vectors a_i, I in number, as:

$$A = a_1, a_2, \ldots, a_i, \ldots, a_I,$$

said input pattern being representative of a first predetermined number k of continuously spoken words, said first predetermined number being equal at least to unity; a reference pattern memory for memorizing reference patterns B^n representative of a second predetermined number of words n, each reference pattern being represented by a time sequence of referene pattern feature vectors b_j^n, J^n in number, as:

$$B^n = b_1^n, b_2^n, \ldots, b_j^n, \ldots, b_{J^n}^n;$$

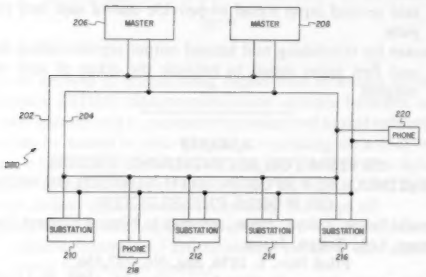
and means responsive to said input and reference pattern feature vectors for recognizing said input pattern to be a concatenation of the reference patterns, k in number; the improvment wherein said means comprises a word number specifier for specifying the number K of words of said input pattern, said word number K being preselected for a predetermined duration to be equal at least to unity with reference to said first predetermined number; and recognition means responsive to said word number K and said input and reference pattern feature vectors for deciding said concatenation.

4,049,914

FREQUENCY DIVISION MULTIPLEX VOICE COMMUNICATION APPARATUS WITH HIERARCHY OF STATIONS

Dean T. Anderson, Marion, and Joseph A. Vanous, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 30, 1976, Ser. No. 719,020
Int. Cl.² H04M 1/70
U.S. Cl. 179—2.5 R **5 Claims**



1. Communication apparatus comprising, in combination:

transmitting means, including output means, for providing at said output means both radio frequency carrier modulated communication signals and audio frequency signals, said transmitting means transmitting communication signals on a plurality of channels and supplying a signaling carrier on at least one of said channels only during periods of transmission of communication signals;

first receiving means for detecting only audio frequency signals;

second receiving means for detecting only carrier modulated signals;

a single communication link means connecting said first and second receiving means to said transmitting means; and

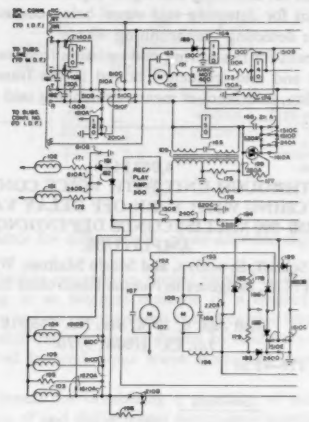
third receiving means, connected to said communication link, for detecting carrier modulated signals and for inhibiting operation thereof only during the time of receipt of said signaling carrier.

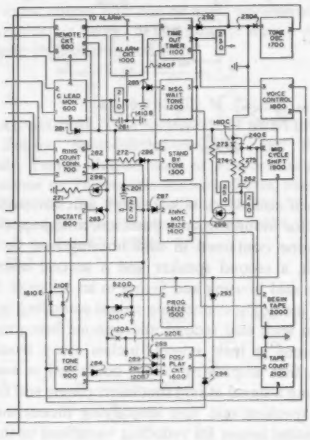
4,049,915

REMOTE ACCESS FOR CENTRALLY LOCATED ANSWERING AND RECORDING EQUIPMENT

Dean Wilson Danner, New Berlin, Wis., assignor to GTE Automatic Electric Laboratories Incorporated

Filed June 20, 1975, Ser. No. 589,156
Int. Cl.² H04M 1/64
U.S. Cl. 179—6 C **4 Claims**





1. Telephone answering and recording apparatus, connected by means of first and second lines to a telephone switching system including signal generating means and serving a plurality of subscriber's subsets, each of said subsets including calling signal generating means, a first one of said subsets including circuit connections directly to said first line, a second one of said subsets connected to said second line through said switching means, and said telephone answering and recording apparatus including: a recording and playback medium connectible to either said first of said second line, adapted for playback of messages to said subscriber's subsets, ringing signal detection means connected to said first line and to said playback medium operable in response to ringing signals received from said switching system; remote access means including an optical isolator including an output circuit; a full wave rectifier connected between said second line and said optical isolator; and a relay including a coil having circuit connections to said optical isolator output and a plurality of circuit contacts connected to

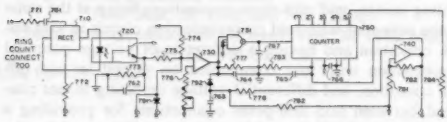
said first and to said second lines; said rectifier operated in response to said ringing signal to convert said ringing signal to to a direct current signal and said optical isolator operated in response to said direct current signal to operate said relay to disconnect said first telephone line from said ringing signal detection means and connect said second line to said ringing signal detection means; said ringing signal detection means operated in response to ringing signals received from said switching system over said second line to initially operate said playback medium and connect said medium to said second line whereby an announcement message is transmitted over said second line through said switching system to said second subscriber subset; calling signal detection means connected to said second line in response to operation of said remote access circuit and said ringing signal detection means; and in response to a calling signal generated at said second subset, said calling signal detection means operated to further operate said medium to transmit recorded messages over said second line, through said switching system to said second subscriber subset.

4,049,916

RING DETECTOR CIRCUIT FOR CENTRALLY LOCATED ANSWERING AND RECORDING EQUIPMENT

Dean Wilson Danner, New Berlin, Wis., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 20, 1975, Ser. No. 589,157
Int. Cl.² H04M *1/64*
U.S. Cl. 179—6 C **7 Claims**



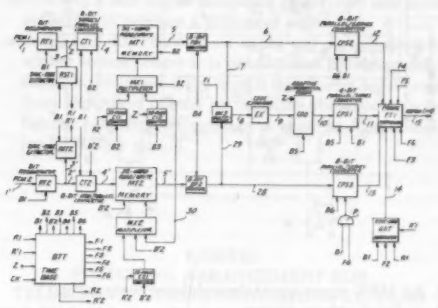
1. Telephone answering and recording apparatus, connected to a telephone switching system serving a plurality of subscribers and including ringing signal generating means, said telephone answering and recording apparatus including a playback medium connectible to said switching system and adapted for playback of announcement messages through said switching system to at least one of said subscribers, and ringing signal detection means connected to said switching system and to said playback medium, said ringing signal detection means comprising: an optical isolator including an input circuit connected to said switching system; counting means including a plurality of outputs, a predetermined one of said outputs connected to said playback medium; and a comparator circuit connected between said optical isolator and said counting means, and including a circuit connection to a source of reference potential; said optical isolator operated to conduct output signals to said comparator circuit in response to receipt of ringing signals generated in said switching system; said comparator circuit operated in response to each output signal from said optical isolator of higher potential than said connected reference potential, to transmit an advance signal to said counting means; said counting means advanced in response to each advance signal received from said comparator to provide an operate signal sequentially at each of said outputs, until an operate signal is transmitted over said predetermined output to said playback medium; said medium operated in response to said received operate signal to play back an announcement message through said switching system to at least one of said subscribers.

4,049,917

PCM TELECOMMUNICATION SYSTEM WITH MERGER OF TWO BIT STREAMS ALONG A COMMON SIGNAL PATH

Maurizio Copperi, and Luciano Nebbia, both of Turin, Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Apr. 23, 1976, Ser. No. 679,787
Claims priority, application Italy, Apr. 23, 1975, 68030/75
Int. Cl.² H04J *3/04*
U.S. Cl. 179—15 AP **21 Claims**



5. A system for transmitting two groups of digitized message samples derived from voice signals, arriving simultaneously at a first terminal in the shape of two sets of $2n$-bit code words respectively forming part of recurrent frames in two original bit streams, to a second terminal via a common PCM signal path linking said terminals, comprising:

first transcoding means including an adaptive differential quantizer at said first terminal for converting $2n$-bit code words into substantially equivalent n-bit code words;

first circuit means at said first terminal for feeding the $2n$-bit code words from said original bit streams to said first transcoding means;

first synthesizing means at said first terminal connected to said first transcoding means for interleaving n-bit words derived from the $2n$-bit code words of said original bit streams in frames of a composite bit stream having the same length as the frames of said original bit streams, said first synthesizing means being coupled to said common signal path for transmitting said composite bit stream to said second terminal;

second transcoding means at said second terminal complementary to said first transcoding means for reconverting n-bit words into substantially equivalent $2n$-bit code words;

second circuit means at said second terminal coupled to said common signal path for feeding the n-bit code words of said composite bit stream to said second transcoding means for reconversion into $2n$-bit code words substantially corresponding to the $2n$-bit code words of said original bit streams;

second synthesizing means at said second terminal connected to said second transcoding means for assembling the reconverted $2n$-bit code words into frames forming part of two reconstituted bit streams substantially replicating said original bit streams;

a code expander in said first circuit means upstream of said differential quantizer; and

a complementary code compressor inserted between said second transcoding means and said second synthesizing means.

4,049,918

MPX STEREO SIGNAL DEMODULATOR

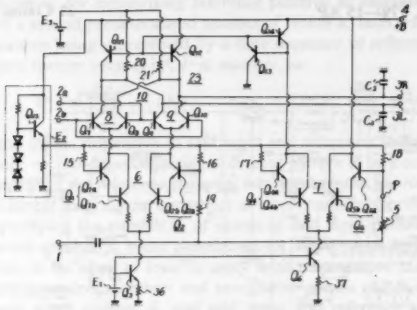
Misuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 8, 1976, Ser. No. 731,018

Claims priority, application Japan, Oct. 9, 1975, 50-122276; Oct. 10, 1975, 50-122008

Int. Cl.[2] H04H 5/00

U.S. Cl. 179—15 BT **11 Claims**



1. An MPX stereo signal demodulator comprising:

A. a direct voltage source;

B. a first differential amplifier including at least a first pair of transistors and a common emitter impedance connected to a reference voltage point;

C. a second differential amplifier including at least a second pair of transistors with the emitters thereof connected to each other and to the collector of one of the transistors of said first differential amplifier;

D. a third differential amplifier including at least a third pair of transistors with the emitters thereof connected to each other and to the collector of the other transistor of said first differential amplifier;

E. coupling circuit means for coupling the collector of one of the transistors of said second differential amplifier to a first connection point comprising the collector of one of the transistors of said third differential amplifier and coupling the collector of the other transistor of said second differential amplifier to a second connection point comprising the collector of the other transistor of said third differential amplifier, respectively, said connection point comprising a pair of signal output terminals;

F. a fourth differential amplifier including at least a fourth pair of transistors and a common emitter impedance connected to the reference voltage point;

G. current mirror circuit means connected between said direct voltage source and collector circuits of said second, third and fourth differential amplifiers;

H. signal input means for applying a composite stereo signal to said first and fourth differential amplifiers and for applying a subcarrier signal to said second and third differential amplifiers, respectively; and

I. means for varying the composite signal levels applied to said first and fourth differential amplifiers, relatively, so as to adjust separation characteristics between the output signals at said signal output terminals.

4,049,919

COMMUNICATION SYSTEM TRUNK CIRCUIT

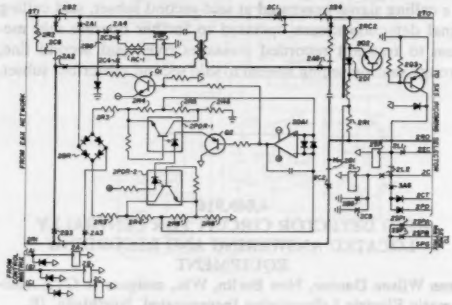
John S. Young, Addison, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 3, 1976, Ser. No. 738,507

Int. Cl.[2] H04Q 3/18

U.S. Cl. 179—18 FA **6 Claims**

1. An electronic sensing circuit for use with a telephone communication circuit of two-wire configuration and including off-hook and on-hook conditions, comprising: a first voltage divider network including a first and a second pair of series connected resistor elements having a mid-point connection between said pairs of series connected resistors and having one circuit end thereof connected to a first wire of said two-wire communication circuit and the other circuit end thereof connected to a voltage supply source, a second voltage divider network including another two pairs of series connected resistor elements having a mid-point connection between said pairs of series connected resistors and having one circuit end thereof connected to a second wire of said two-wire communication circuit and the other circuit end thereof connected to ground potential, and further including a first and a second connection respectively to the junction of each of said resistors of each said pair of resistors of said first voltage divider network to a



first shunting means and a third and fourth connection respectively to the junction of each of said resistors of each said pair of resistors of said second voltage divider network to a second shunting means, said mid-point connections being at the same voltage potential with said communication circuit in said on-hook condition and having a difference of voltage potential there-between with said communication circuit in said off-hook condition, and differential voltage detecting means connected between said mid-point connections for providing a first output signal during said on-hook condition and for detecting said voltage difference occurring with said off-hook condition of said communication circuit to provide a second output signal, and means responsive to said detecting means for operating said shunting means upon the detection of an on-hook condition after an off-hook condition to present a lower impedance to said communication circuit.

4,049,920

ANALOG SIGNAL SUMMING CONFERENCE CIRCUIT

Dieter John Henry Knollman, Arvada, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 18, 1976, Ser. No. 733,380

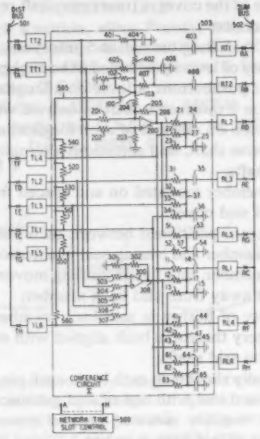
Int. Cl.[2] H04M 3/56

U.S. Cl. 179—18 BC **8 Claims**

1. A conference circuit for establishing a simultaneous interchange of information among plural ports, each of which ports contains at least a first terminal for transmitting the analog information signal of a respectively associated conferee and at least a second terminal for receiving the combined analog information signals transmitted from the other ports, a portion of which combined analog information signals is retransmitted through such port to the first terminal thereof, the conference circuit comprising:

means for mixing signals from the first terminal of each of a plurality of the ports to produce a separate signal for the second terminal of each of a plurality of the ports, each port comprising with the mixing means and the other ports a different potentially oscillatory loop circuit, each of the separate signals comprising the algebraic sum of the analog information signals from the first terminal of each

of a plurality of the ports in selectable phases and amplitude proportions so as to offset the retransmitted signals



against one another to a sufficient degree to inhibit oscillations in each such loop circuit.

4,049,921

METHOD FOR FORMING A CONFERENCE CONNECTION IN A TIME DIVISION MULTIPLEX TELECOMMUNICATION SWITCHING SYSTEM

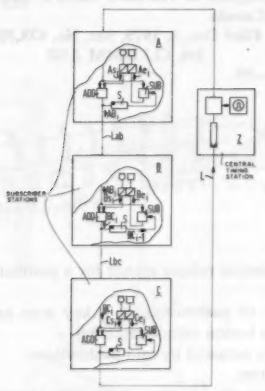
Eduard Zwack, Puchheim, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 18, 1975, Ser. No. 614,513

Claims priority, application Germany, Sept. 20, 1974, 2445129

Int. Cl.[2] H04M *3/56*

U.S. Cl. 179—18 BC **3 Claims**



1. A method for connecting at least three subscriber stations participating in a conference call in a time division multiplex (TDM) telecommunication system wherein the subscriber stations are connected by a TDM ring-like circuit comprising the steps of:

generating in each said participating subscriber station a first TDM signal having a value corresponding to the instantaneous speech signal amplitude issuing from that subscriber station,

adding said first signal so generated in a said participating subscriber station to an incoming TDM signal coupled to that subscriber station through a portion of said ring circuit cnnected thereto and to another said participating subscriber station to form a composite signal which is the sum of the values of said first signal and said incoming TDM signal, said incoming signal appearing in a time position allocated to the conference call,

transmitting said composite signal from said participating subscriber station wherein it is formed over another portion of said TDM ring circuit to a further subscriber station participating in the conference call,

storing said composite signal in said subscriber station where it is formed for the duration of a signal cycle through said TDM ring circuit,

subtracting a said stored composite signal from said incoming signal to produce a difference signal and

utilizing said difference signal in the said participating subscriber station where it is produced as providing the instantaneous values of the speech signal amplitudes issuing from the others of said participating subscriber stations, thereby providing the signal to be heard in said participating subscriber station.

4,049,922

SWITCHING ARRANGEMENT FOR TELECOMMUNICATION SWITCHING SYSTEMS

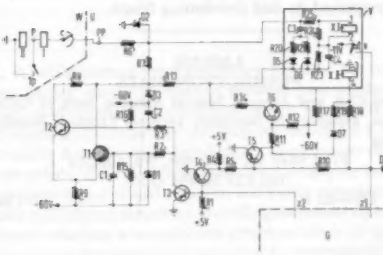
Justus König, Munich; Josef Röhrig, Oberhaching, and Friedrich Hilliges, Eichenau, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 22, 1976, Ser. No. 668,955

Claims priority, application Germany, Mar. 21, 1975, 2512551; Dec. 11, 1975, 2555860

Int. Cl.[2] H04M *3/22*

U.S. Cl. 179—18 AB **4 Claims**



1. In a telecommunication switching system wherein each switching element which is idle is so indicated by an idle potential caused to appear at a test point by a seizing circuit of the switching element and the blocked condition is indicated by the absence of said idle potential, wherein the idle or blocked states of a switching element are determined by test switches in a test and seizing circuit in a preceding switching element that attempts to seize the switching element in question and wherein guarding of a blocked switching element is effected by applying a potential differing from said idle potential to the test and seizing circuit in the preceding switching element, the improvement comprising:

means for preventing seizure attempts on a said seizing circuit in a said switching element in the course of a connection release thereof comprising:

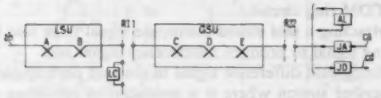
current monitoring means in said seizing circuit for sensing a decrease in the current flowing during the blocked condition of said switching element and

means responsive to an indication of a decrease in current flow from said monitoring means for opening said seizing circuit until said switching element is completely released.

4,049,923
SWITCHING NETWORK EMPLOYING AN IMPROVED INTERCONNECTION

Jean-Pierre André Dartois, Paris, France, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 402,767, Oct. 2, 1973, abandoned. This application Oct. 31, 1975, Ser. No. 627,578
Claims priority, application France, Oct. 27, 1972, 72.38126
Int. Cl.[2] H04Q *1/16*
U.S. Cl. 179—18 GE 4 Claims

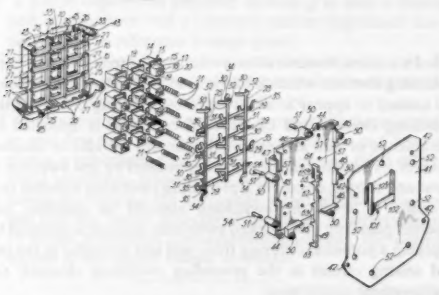


1. A multiple-stage automatic switching network in which each stage of the network comprises a plurality of matrices comprised of intersecting input and output conductors, and in which the network includes a multiple-stage line selection unit at one end of the network and a multiple-stage group selection unit at the other end thereof, an intermediate distributing frame for interconnection of output conductors of the final stage of said line unit and the input conductors of the first stage of said group selection unit, a first plurality of links across said distributing frame, said links being individually disposed between an output conductor of the final stage of said line unit and an input conductor of the first stage of said group selection unit for the processing of calls serially through the stages of said network, a plurality of loop circuits at said frame, each said loop circuit having connection through terminals at said intermediate distributing frame to two input conductors of the first stage of said group selection unit for the return of calls serially transmitted from the output conductors of the final stage of said group selection unit serially doubled back through the stages of said group selection unit, with said links and said loop circuits interspersed on said distributing frame.

4,049,924
PUSHBUTTON DIALS

Pak-Jong Chu, and Jacques Marcel Audette, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 20, 1976, Ser. No. 688,381
Int. Cl.[2] H04M *1/50*
U.S. Cl. 179—90 R 10 Claims

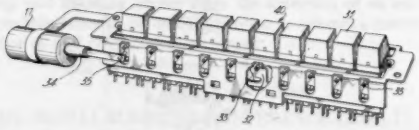


1. A pushbutton dial comprising:
- a cover having a plurality of apertures therein, said apertures arranged in columns and rows;
- a pushbutton in each aperture, each pushbutton having an upper portion, a base portion and a flange extending peripherally of the pushbutton at the junction of said upper and base portions, said upper portion a sliding fit in said aperture and guided thereby;
- a series of longitudinal shafts pivotally supported on the back surface of the cover, a longitudinal shaft related to each column of apertures;
- a series of transverse shafts pivotally supported on the back surface of the cover, a transverse shaft related to each row of apertures;
- each of said longitudinal and transverse shafts having a plurality of levers positioned to be engaged by said flanges on said pushbuttons, a lever on a longitudinal shaft and a lever on a transverse shaft associated with each flange;
- an extension on one end of each longitudinal shaft and each transverse shaft, said extensions alternating at said ends of said shafts;
- a back member mounted on and spaced from the back surface of said cover;
- spring means positioned between each pushbutton and said back member and biasing said pushbutton away from said back member, said flange limiting movement of said pushbutton away from said back member;
- a plurality of bushes in said back member adjacent to the periphery thereof, a bush aligned with each of said extensions on said shafts;
- a pin axially slidable in each bush, each pin in engagement at a forward end with one of said extensions on said shafts;
- a circuit member mounted on and spaced from the back surface of said back member;
- a plurality of pairs of spring contacts mounted on the back surface of said circuit member adjacent the periphery thereof, a pair of contacts associated with each bush and related pin;
- said pins extending through holes in said circuit member, a rearward end of each pin in engagement with a contact of one of said pairs of spring contacts.

4,049,925
SOLENOID CIRCUIT FOR PUSHBUTTON RELEASE IN TELEPHONES

Graham Stirling Laing, and Shiro Tom Ito, both of London, Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Dec. 8, 1975, Ser. No. 638,306
Int. Cl.[2] H04M *1/08*
U.S. Cl. 179—99 5 Claims



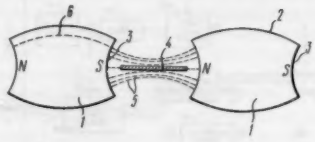
1. A pushbutton release circuit for a pushbutton telephone, comprising:
- a plurality of pushbuttons in a key strip and including a common button release latch bar;
- a first relay actuated by said pushbuttons;
- a hold button;
- a pushbutton release solenoid connected to said latch bar for actuation to release any depressed button;
- a second relay for actuating said solenoid; and for connection and disconnection of tip and ring lines in said telephone;
- a delay circuit for delaying actuation of said second relay until after actuation of said first relay;
- means actuated by said hold button to connect said delay circuit into the release circuit;
- actuation of said hold button connecting said delay circuit and releasing said first relay, the delay circuit energizing said second relay to actuate said solenoid after release of said first relay.

4,049,926

RIBBON LOUDSPEAKER ACHIEVES FOCUSING AND UNIFORMITY OF THE MAGNETIC FLUX IN THE WORKING GAP

Alexei Fedoseevich Kasatkin, ulitsa Pravdy, 7/9, kv. 42; Jury Vasilievich Smirnov, ulitsa Alabyana, 11, kv. 44, and Ilya Afanasievich Feldman, ulitsa Dubininskaya, 6, korpus 1, kv. 269, all of Moscow, U.S.S.R.

Filed Jan. 5, 1976, Ser. No. 646,546
Claims priority, application U.S.S.R., Jan. 14, 1975, 2090006
Int. Cl.[2] H04R *9/02*
U.S. Cl. 179—115 V **6 Claims**



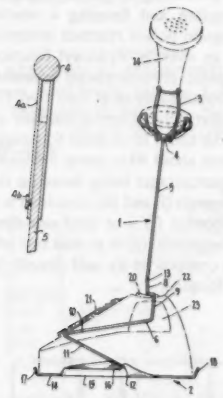
1. A ribbon loudspeaker comprising at least two permanent magnets together making up a magnetic system, said magnets being spaced from each other generally along an axis, each permanent magnet having a pair of generally convex opposing side surfaces spaced from said axis, and having a pair of generally concave opposing pole surfaces spaced from each other along said axis, the facing concave pole surfaces of two adjacent permanent magnets together defining a working gap; and a freely vibrating sound reproducing ribbon positioned in said working gap.

4,049,927

TELEPHONE HAND-SET HOLDING MEANS

Leslie Joseph Sutton, 46 Leonard Street, Frankston, Victoria, Australia (3199)

Filed May 11, 1976, Ser. No. 685,154
Claims priority, application Australia, May 16, 1975, 1633/75
Int. Cl.[2] H04M *1/12*
U.S. Cl. 179—150 **6 Claims**



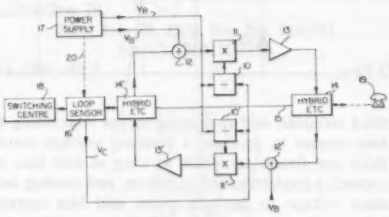
1. A telephone hand-set supporting device for supporting a hand-set, whereby listening and speaking can be effected without requiring the hand-set to be held by the user, said hand-set being usable with a telephone body having a cradle disposed at the upper part of said body for conventionally receiving said hand-set and switch hooks disposed near said cradle which when depressed permit the receipt of ringing signals and when released enable the transmission of outgoing and ingoing conversation signals, said telephone handset supporting device comprising a support member for receiving and supporting the hand-set at a point above the telephone body, and a base member for receiving said telephone body, the support member being pivoted on the base member at a point below said switch hooks, the support member being moveable from a first position to a second position, the support member bearing on the cradle of the telephone body in said first position thereby depressing the switch hooks so that the telephone is in a condition to receive said ringing signals, the support member not bearing on the cradle of the telephone body in said second position thus permitting the switch hooks to release, the telephone thereby being in a condition to enable said transmission of outgoing and incoming conversation signals, the base member being mountable under the base of the telephone body whereby when the support member is in the second position, the hand-set and hand-set supporting device is supported and maintained relative to the base of the telephone body and is of such a length as to be in a position adjacent to the mouth and ear of the telephone user, thereby leaving the user's hands free.

4,049,928

SELF-ADJUSTING VOICE FREQUENCY REPEATER

Israel Levi, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed June 30, 1976, Ser. No. 701,151
Int. Cl.[2] H04B *3/36*
U.S. Cl. 179—170 R **5 Claims**



1. A self-adjusting voice-frequency repeater for subscriber loops having ohmic resistances between two predetermined values comprising, in combination: means for dividing a control signal proportional to the loop resistance by a temperature-stable d-c reference signal; multiplying means responsive to the output of the dividing means for multiplying said output by an input signal of said repeater; and buffer means responsive to said multiplying means for providing an output signal of said repeater, whereby a temperature generated error of said multiplying means is substantially cancelled by an opposite, temperature generated error of said dividing means.

4,049,929

APPARATUS FOR REDUCING THE SUSCEPTIBILITY OF LINE SIGNAL REPEATERS TO INDUCED CURRENTS

Edward Thomas Ball, Coquitlam, Canada, assignor to GTE Lenkurt Electric (Canada) Ltd., Burnaby, Canada

Filed Dec. 16, 1976, Ser. No. 751,128
Int. Cl.[2] H04B *3/44*
U.S. Cl. 179—170 J **9 Claims**

1. In a telecommunication system having at least one signal repeater, apparatus for reducing the susceptibility of said repeater to induced currents in said signal line comprising:

an input circuit including first and second input terminals, said input circuit when coupled to said line receiving an input current having a DC and an induced AC component;

an output circuit including third and fourth output terminals, said output circuit when coupled to said repeater supplying load current thereto, said fourth terminal being common with said second terminal;

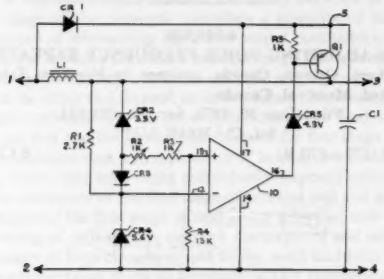
impedance means connected between said first and third terminals, said impedance means for receiving said input current and for supplying said load current and bias current;

a fifth terminal;

energy storage means connected across said fourth and fifth terminals;

rectifying means connected across said first and fifth terminals, said rectifying means being conductive when said DC and AC current components are of the same polarity and said means being nonconductive when said DC and AC current components have opposite polarity, said rectifying means thereby permitting said AC current component to charge said energy storage device when said DC and AC current components have the same polarity;

voltage regulating means connected across said fourth terminal and the junction of said impedance means and said



third terminal, said regulating means responding to said bias current to produce a constant voltage across said third and fourth terminals so long as said bias current exceeds a predetermined minimum, and causing said constant voltage to decrease when said bias current falls below said minimum, said regulating means also providing a control output signal indicative of any decrease in voltage across said regulating means; and

gating means connected across said third and fifth terminals and responsive to said control output signal, said gating means being non-conductive when said DC and AC input current components are of the same polarity and being conductive when said input current components are of opposite polarity, said means thereby controlling the rate of energy discharge from said energy storage means to said output circuit and causing the energy in said energy storage means to supplement said input current when said AC and DC current components are of opposite polarity.

4,049,930

HEARING AID MALFUNCTION DETECTION SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Roger L. Kessinger, Houston, Tex.

Filed Nov. 8, 1976, Ser. No. 739,914

Int. Cl.[2] G01R *25/00*

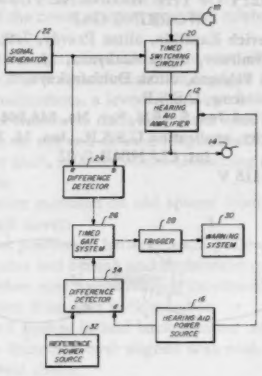
U.S. Cl. 179—175.1 A **28 Claims**

1. A system for detecting malfunctions in hearing aids by periodically applying a test signal at a first point of said hearing aid and comparing the resulting processed signal at a second point of said hearing aid with a reference signal comprising:

a. signal generation means for providing said test signal and said reference signal;

b. timed switching means for periodically applying said test signal at said first point of said hearing aid for a test time interval;

c. first difference detection means for comparing said processed signal with said reference signal to produce a first difference signal whose amplitude is a measure of difference between said processed signal and said reference signal; and



d. warning system means for indicating whenever said amplitude of said first difference signal exceeds a first value.

4,049,931

CATALYST SYSTEMS CONTAINING DIMETHYLAMINO ETHER MONO-OLS FOR POLYURETHANE FOAM FORMATION

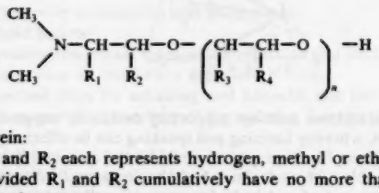
Michael Ray Sandner, Chappaqua, N.Y., and Robert Donovan Duffy, Summersville, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 29, 1975, Ser. No. 581,745

Int. Cl.[2] B01J *27/24, 31/12;* **C08G** *18/18*

U.S. Cl. 260—2.5 AC **50 Claims**

1. A method for producing a cellular urethane polymer which comprises reacting and foaming a reaction mixture containing: (1) an organic polyol reactant comprising a polyether polyol having an average hydroxyl functionality of at least two; (2) an organic polyisocyanate reactant having an average isocyanato functionality of at least two; (3) a blowing agent; and (4) a catalytically effective amount of a catalyst system comprising from about 10 to about 95 weight percent of component (i) and from about 90 to about 5 weight percent of component (ii), said percentages being based on the combined total weight of components (i) and (ii) contained in the reaction mixture, where component (i) is at least one dimethylamino ether mono-ol and component (ii) is at least one other tertiary-amine different from component (i), said dimethylamino ether mono-ol having the formula,



wherein:

R_1 and R_2 each represents hydrogen, methyl or ethyl provided R_1 and R_2 cumulatively have no more than two carbon atoms;

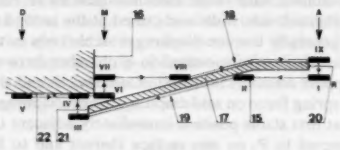
R_3 and R_4 each represents hydrogen, methyl or ethyl provided R_3 and R_4 cumulatively have no more than two carbon atoms; and

n has an average value of at least one and no more than about five.

4,049,932
SAFETY DEVICE FOR A ROTARY STARTER SWITCH FOR AN AUTOMOBILE VEHICLE

Claude Jawdoszyn, Bois-Colombes, France, assignor to Neiman, S.A., Courbevoie, France

Filed May 12, 1976, Ser. No. 685,472
Claims priority, application France, June 4, 1975, 75.17375
Int. Cl.[2] H01H *27/00*
U.S. Cl. 200—44 7 Claims

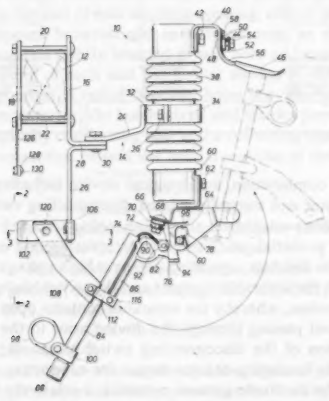


1. A safety device for a rotary starter switch comprising a rotatable part and a fixed part, said rotatable part being movable relative to said fixed part between an operative, starter operating position, and an inoperative, engine stopped, position, cam means on one of said parts and resilient follower means on the other of said parts, said follower means flexing during relative rotation of said parts to cooperate with said cam means, said cam means being effective to cause said follower means to follow a first path relative to said one of said parts as said rotatable part moves from said inoperative to said operative position, and a second path as said rotatable part moves from said operative to said inoperative position, and abutment means on said one part, cooperating with said follower means to preclude movement of said follower means on said second path to said operative position, said follower means comprising a spring blade, an edge region of said blade cooperating with said abutment means, and said blade being fixedly secured to the other of said parts.

4,049,933
ELECTRICAL SHORTING DEVICE

Jack R. Lovett, 1900 Irving, Orange, Tex. 77630

Filed July 18, 1975, Ser. No. 597,305
Int. Cl.[2] H01H *31/00*
U.S. Cl. 200—48 R 2 Claims



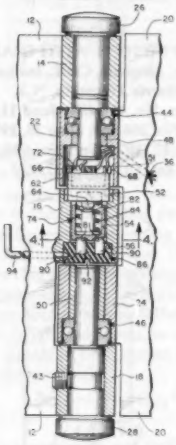
1. A safety switch for an electrical transmission line and for assuring repairmen that said line is safely de-energized for enabling such repairmen to perform work upon such transmission line, said switch being adapted to be mounted relative to a utility pole for supporting said transmission line, the invention comprising:

a. An insulator for receiving said transmission line;
b. Said transmission line being formed of first and second conductors with said insulator being mounted therebetween;
c. Means mounted at each end of said insulator for electrically connecting said conductors with said insulator;
d. Grounding means mounted adjacent said insulator with the utility pole;
e. A conductor bar pivotally and electrically connected with one of said means for electrically connecting said insulator, said conductor bar being pivotal to a first position which electrically connects said conductors to each other to form said transmission line for conducting of electricity therethrough being pivotal to a second position for contact with said grounding means to completely ground said transmission line to enable workmen to safely repair and work on said transmission lines.

4,049,934
SECURITY HINGE HAVING ADJUSTABLE CAM OPERATOR AND RECIPROCABLE CAM FOLLOWER ACTUATED SWITCH

Robert L. Newlon, Sterling, Ill., assignor to Lawrence Brothers Inc., Sterling, Ill.

Filed July 30, 1976, Ser. No. 710,094
Int. Cl.[2] H01H *3/16*
U.S. Cl. 200—61.7 12 Claims



1. A hinge construction comprising first and second pivotally connected hinge leafs, each said leaf including means adapting same for attachment to a door or a door frame, or the like, each leaf further including at least one knuckle which is disposed adjacent to and is movable relative to the knuckle on the other of said leaves, an electrical circuit component carried by one of said knuckles, actuator means associated with said circuit component, and capable of producing a change in condition thereof, operating means carried by the other of said knuckles, such that upon movement of said hinge leaves relative to each other, said operating means will be moved relative to said circuit component and said actuator means to operate said actuator means and thereby produce a change in the condition of said electrical circuit component, which change in condition may be used as an indication of a change in the relative orientation of said hinge leaves, said actuator means comprising a movable plunger on said component for altering the condition thereof, and piston means non-rotatably mounted

with respect to said circuit component, but being movable axially with respect to said circuit component for engagement and operation of said plunger, said piston means including cam means on the end thereof remote from said circuit component, said operating means carried by the other of said hinge knuckles comprising a member adapted to be fixedly positioned with respect to said other knuckle for movement therewith relative to said circuit component and said piston means; said member including cam means formed thereon engageable with the cam means on piston means to produce axial movement thereof and operation of said plunger, as an incident to movement of said hinge leaves.

6. A hinge construction comprising first and second hinge leafs, each leaf including at least one hinge knuckle which knuckles are juxtaposed in the assembled condition, means for maintaining said hinge leaves in an assembled condition, and an electrical switch carried within one of said knuckles and including a plunger for the operation thereof, operating means carried within the other of said knuckles, and actuator means disposed between said operator means and said switch plunger, which actuator means is operatively and non-rotatably engaged with said switch, while being free to move axially to achieve movement of said plunger, and cam means carried by said operating means and said actuator means capable of producing axial movement of said plunger upon relative movement of said hinge leaves, as would be occasioned upon the opening or closing of a door, said switch, operating means and actuator means being entirely housed within said juxtaposed knuckles and thus being concealed from view when said hinge, is in the assembled condition, said actuator means comprising piston means non-rotatably mounted with respect to said switch, but being movable axially with respect to said switch for engagement and operation of said plunger.

4,049,935

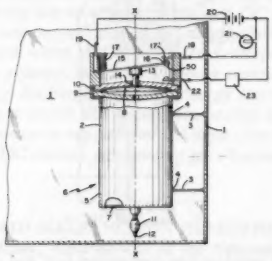
PRESSURE SWITCH WITH DIAPHRAGM

William Paul Gruber, Altadena, Calif., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation of Ser. No. 478,404, June 11, 1974, which is a continuation of Ser. No. 266,880, June 28, 1972. This application May 17, 1976, Ser. No. 686,864

Int. Cl.[2] H01H *35/34*

U.S. Cl. 200—83 P **8 Claims**



1. In a vehicle having an air cushion device for protection of an occupant in the vehicle, a pressure switch for energizing a signal device upon release of gas stored in a chamber for filling said air cushion device, said pressure switch disposed within a pressure chamber containing a gas having a pressure of P_2, said switch including a pressure vessel, said vessel sealed from gas communication with its surroundings, said vessel containing gas having a pressure of P_1, said pressure established as a result of the sealed vessel environment and the temperature of the environment, said vessel circumscribed by an end wall at one end thereof, side walls and closed at the second end by a flexible, generally convex diaphragm stable only in two positions, said diaphragm mounted in a chamber between apertured support members mounted in said switch and absent any external spring force on said diaphragm, said diaphragm biased in a preset first stable position and subjected to P_2 on one surface thereof and to P_1 on the surface thereof, said diaphragm assuming said first position under its own bias when P_2 does not exceed P_1 by a predetermined amount and snapping to the second stable position when P_2 does exceed P_1 by said amount, and switch means operatively associated with movement of said diaphragm for energizing said signal device when said diaphragm assumes said first position.

7. A pressure switch for energizing a signal device upon release of gas stored in a pressure chamber at a pressure of P_2, said switch including a pressure vessel, said vessel sealed from gas communication with its surroundings, said vessel containing gas having a pressure of P_1, said pressure established as a result of the sealed vessel environment and the temperature of the environment, said vessel circumscribed by an end wall at one end thereof, side walls and closed at the second end by a flexible, generally convex diaphragm stable only in two positions, said diaphragm mounted in a chamber between apertured support members mounted in said switch and absent any external spring force on said diaphragm, said diaphragm biased in a preset first stable position immediately adjacent the vessel and subjected to P_2 on one surface thereof and to P_1 on the other surface thereof, said diaphragm assuming said first position under its own bias and snapping to a second stable position moved away from said position immediately adjacent the vessel upon P_2 lessening a predetermined amount, and switch means operatively associated with movement of said diaphragm for energizing said signal device when said diaphragm assumes said first position.

4,049,936

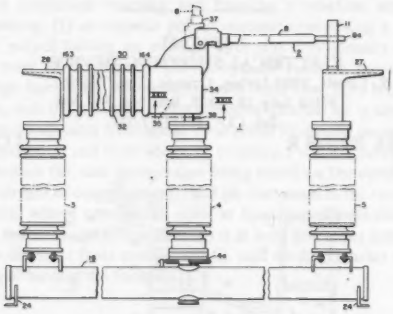
QUICK-ACTING MOVABLE OPERATING-COLUMN TRIPPING DEVICE

Russell E. Frink, Pittsburgh, and Stanislaw A. Milianowicz, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 468,332, May 8, 1974. This application Mar. 18, 1975, Ser. No. 559,465

Int. Cl.[2] H01H *33/12*

U.S. Cl. 200—146 R **12 Claims**



1. In combination, an electrical device including a circuit-interrupter and a serially-related disconnecting switch having a movable switchblade all at high voltage spaced away from ground potential, said circuit-interrupter having one or more separable contacts, operating means at high voltage for operating both the separable contacts and the switchblade contacts in synchronism, whereby the separable contacts open the electrical circuit passing through the device prior to the subsequent separation of the disconnecting switch contacts, only single rotatable insulating column means for supporting said device up in the air above ground potential, a relatively slow-acting operating mechanism disposed at ground potential, said single rotatable insulating column means rotatively transmitting during opening and closing rotative motions from said relatively

slow-acting operating mechanism at ground potential to said high-voltage operating means, said separable contacts remaining open in the fully open-circuit position of the electrical device, the operating mechanism at high voltage functioning to close the disconnecting contacts during the closing operation prior to point of time to the subsequent closing of the separable contacts in the high-voltage circuit interrupter, said sole single rotatable insulating column means including two relatively-movable component parts disposed adjacent the base thereof, biasing means for urging relative motion between said two component parts, means latching said two component parts to remove together as a unit while under bias during rotation of the sole rotatable insulator, and tripping means at ground potential for releasing said latching means to permit the biasing means to effect relative motion of said two relatively-movable parts, whereby face-acting rotation of said single sole insulator column occurs and trip-operation of the circuit-interrupter contacts occurs independently of the relative slow motion of the grounded operating mechanism.

4,049,937

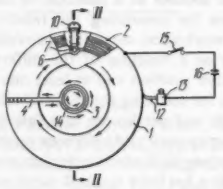
INDUCTOR FOR WORKING METALS BY PRESSURE OF PULSATING MAGNETIC FIELD

Lev Timofeevich Khimenko, poselok Pokotilovka, ulitsa Ulyanovskaya, 35, and Alfred Lvovich Shlyakht, ulitsa Dzerzhinskogo, 32, kv. 15, both of Kharkov, U.S.S.R.

Filed Mar. 8, 1976, Ser. No. 664,495

Int. Cl.[2] H05B 5/08

U.S. Cl. 219—7.5 **2 Claims**



1. An inductor, for working metals by using the pressure of a pulsating magnetic field, comprising: a concentrator with a working opening to receive an article to be worked, a radial slot which connects the working opening with the outer surface of the concentrator, annular grooves provided on the outer surface of the concentrator, each annular groove receiving a flat helical section of a winding, and a bore provided in the body of said concentrator next to the annular grooves and parallel to the axis of said working opening; ribs of the concentrator disposed between said annular grooves; an electrically conducting rod tightly inserted in said bore and enveloped by the beginning of each said flat helical section of the winding; screws received in radial threaded holes provided in said ribs of the concentrator, the butt ends of said screws pressing upon said electrically conducting rod; and a collecting bus for parallel interconnection of said flat helical sections of the winding.

4,049,938

MICROWAVE OVEN

Akihiko Ueno, Higashiosaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

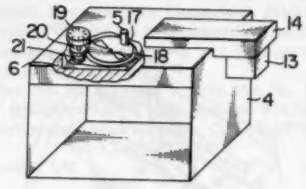
Filed May 11, 1976, Ser. No. 685,135

Claims priority, application Japan, May 17, 1975, 50-58853, Nov. 18, 1975, 50-139042

Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 R **11 Claims**

1. A microwave oven comprising a heating cavity in an oven body, a high frequency wave generator for feeding high frequency waves into said heating cavity, radiation detecting means for sequentially detecting radiations from at least two points within said heating cavity, and control means for controlling said high frequency wave generator by signal from said radiation detecting means, said control means controlling



said high frequency wave generator by a signal from that one of said two points which is at relatively higher temperature.

4,049,939

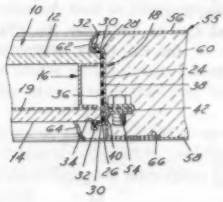
MICROWAVE AND RADIANT WINDOW FOR OVEN DOORS

Joseph W. Katona, Walled Lake, Mich., assignor to Mills Products, Inc., Farmington, Mich.

Filed Apr. 29, 1976, Ser. No. 681,456

Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 D **12 Claims**



1. A self-contained window unit adapted to be assembled into an oven door having front and rear panels provided with aligned window openings therein, comprising a pair of glass panes, means for holding said glass panes in spaced parallel relation, said holding means comprising a frame of electrically conducting material extending about the peripheries of said glass panes and having a mounting flange, a microwave shield of electrically-conducting material parallel to said glass panes and having an edge portion held in surface-to-surface electrical contact with said flange, and means for securing said flange to one of said door panels to both mount said window unit and ground said microwave shield.

4,049,940

DEVICES AND METHODS OF USING HF WAVES TO ENERGIZE A COLUMN OF GAS ENCLOSED IN AN INSULATING CASING

Michel Moisan, Montreal, Canada; Philippe Leprince, Gif-sur-Yvette, France; Claude Beaudry, Laval, Canada, and Emile Bloyet, Gif-sur-Yvette, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed Oct. 30, 1975, Ser. No. 627,271

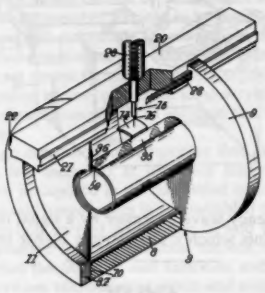
Claims priority, application France, Oct. 31, 1974, 74.36378

Int. Cl.[2] H05G 9/06

U.S. Cl. 219—10.55 R **27 Claims**

1. An excitation device for energizing a column of gas enclosed in an insulating casing of elongated form, said device comprising, in combination: generator means for generating a high frequency periodic electrical field having a frequency of at least 100 megahertz and supply means for supplying a signal of said frequency to the said generator means, said generator means comprising a plasma energizing structure adapted to be disposed on a part of the length of the said elongated casing,

and constituting means for applying a said electrical field to the said column of a value such that, in the absence of a magnetic field, a plasma is generated over a certain length comprising



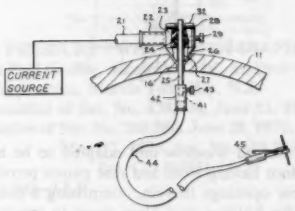
the said part of the length of the elongated casing and an additional length which follows on from said part of the length.

4,049,941

METHOD OF REPAIRING WELDED PIPE SECTIONS

Bennie V. Beatty, Houston, Tex., assignor to Lillie Evelyn Beatty, Houston, Tex.

Filed Apr. 14, 1976, Ser. No. 676,986
Int. Cl.² B23K 9/02
U.S. Cl. 219—61 **4 Claims**



1. A method of repairing welded pipe sections including passing current from outside welded sections of pipe to inside thereof, comprising the steps of:
   a. perforating the weld linking said sections;
   b. enlarging the perforation to a generally conically tapered configuration.
   c. connecting a current source to one end of an electrode;
   d. passing said electrode at least partially through said perforation; and
   e. electrically connecting the other end of said electrode to current utilizing means.

4,049,942

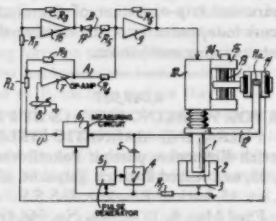
ELECTRIC DISCHARGE MACHINING METHOD AND DEVICE WITH PRESET ELECTRODE FEED

Francois Balleys, Vernier, and Jean Dupraz, Prilly, both of Switzerland, assignors to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed Mar. 19, 1976, Ser. No. 668,750
Claims priority, application Switzerland, Apr. 7, 1975, 4352/75
Int. Cl.² B23P 1/08
U.S. Cl. 219—69 M **7 Claims**

1. A method of machining by applying electrical pulses providing intermittent electrical discharges between an electrode and a workpiece while regulating their relative displacement to maintain a quantity characterizing the sparking conditions at a predetermined value, said method comprising reducing the rate of penetration of the electrode in the workpiece as a function of a quantity representing their relative position in a manner to prevent the electrode from penetrating in the workpiece beyond at least one predetermined final relative position while maintaining the electrical discharges, allowing the electrode and workpiece freedom to move relative to one another as a function of the sparking conditions up to said final relative position and stopping the relative motion of said electrode and workpiece upon reaching said final relative position while maintaining the electrical pulses across said electrode and workpiece.

4. An electrical discharge machining device comprising means for providing intermittent electrical discharges between an electrode and a workpiece, means for providing a first regulating quantity as a function of the difference between a



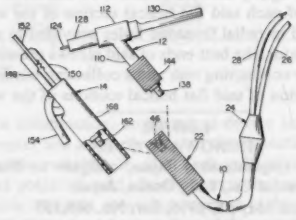
quantity characterizing the sparking conditions and a reference quantity, means for displacing the electrode and workpiece relative to one another as a function of said first regulating quantity, means for measuring the relative position of the electrode and workpiece, means for providing a second regulating quantity as a function of the difference between the measured relative position and at least one reference relative position, means for reducing the speed of relative displacement of the electrode and workpiece as a function of said second regulating quantity until said reference position is reached and means for stopping said relative displacement as soon as said reference position has been reached, while constantly allowing the electrode and workpiece to move relative to one another as a function of said first regulating quantity.

4,049,943

WELDING APPARATUS

Wayne F. Pratt, Plymouth, Mass., assignor to K.A.L. Manufacturing Corporation, Plymouth, Mass.

Filed Oct. 6, 1975, Ser. No. 619,690
Int. Cl.² B23K 9/32
U.S. Cl. 219—74 **7 Claims**



1. Welding apparatus comprising, in combination:
   a cable having a first electrical conductor and a first gas passage, said cable at one end having conductive cable coupling means, said cable coupling means connected to said first conductor and having a valved gas passage, including normally closed valve means, in communication with said first gas passage;
   a first welding torch adapted to hold a first electrode and

having a gas outlet adjacent the position of said first electrode in said torch, said first torch having a second electrical conductor therewithin adapted for connection to said first electrode and a torch gas passage therewithin in communication with said gas outlet, and said first torch having conductive first torch coupling means, said first torch coupling means connected to said second conductor and having a torch coupling gas passage in communication with said second gas passage, said first torch coupling means adapted for selective electrically conductive connection to said cable coupling means with said torch coupling gas passage in communication with said valved gas passage, said first torch coupling means including means for opening said valve means with said first torch coupling means and said cable coupling means connected; and

a second welding torch adapted to hold a second electrode, said torch having a third electrical conductor therewithin adapted for connection to said second electrode, and said second torch having conductive second torch coupling means connected to said third conductor, said second torch coupling means adapted for selective electrically conductive connection to said cable coupling means, said second torch coupling means adapted to maintain said valve means in said normally closed position with said second torch coupling means and said cable coupling means connected.

4,049,944

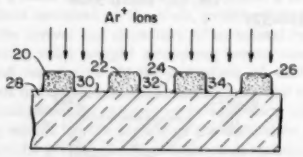
PROCESS FOR FABRICATING SMALL GEOMETRY SEMICONDUCTIVE DEVICES INCLUDING INTEGRATED COMPONENTS

Hugh L. Garvin, Malibu; Amnon Yariv, and Sasson Somekh, both of Pasadena, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 336,679, Feb. 28, 1973, abandoned. This application Aug. 20, 1975, Ser. No. 606,373

Int. Cl.² B23K 9/00

U.S. Cl. 219—121 EM **9 Claims**



1. A process for controlling the surface geometry of a substrate of ion beam-sensitive material including the steps of:

a. forming a resist layer on a surface of said substrate of said material;

b. exposing said resist layer to controlled optical interference patterns, whereby selected regions of said resist layer may be removed thereby leaving a resist mask on the surface of said substrate; and

c. exposing said substrate and mask thereon to an ion beam for machining and partially etching away exposed regions of said substrate, whereby very fine line widths may be achieved for these etched regions and a very high resolution may be obtained in said process while simultaneously minimizing the temperatures to which said substrate and mask are subjected during said process.

4,049,945

METHOD OF AND APPARATUS FOR CUTTING MATERIAL TO SHAPE FROM A MOVING WEB BY BURNING

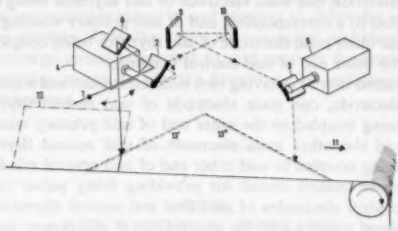
Gunter Ehlscheid, Neuwied; Peter Langenbeck, Frickingen, and Kurt Stemmler, Neuwied, all of Germany, assignors to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG, Neuwied am Rhein, Germany

Division of Ser. No. 513,022, Oct. 8, 1974, Pat. No. 3,965,327. This application Apr. 6, 1976, Ser. No. 674,247

Claims priority, application Germany, Oct. 10, 1973, 2350933

Int. Cl.² B23K 9/00

U.S. Cl. 219—121 LM **16 Claims**



1. Apparatus for cutting a predetermined pattern from a moving web of material, such as paper, cardboard or the like, comprising:

a. a first pivotable mirror;

b. a laser beam source which directs a laser beam onto said first pivotable mirror such that said beam is deflected thereby;

c. a second pivotable mirror located so as to intercept said laser beam after it is deflected by said first pivotable mirror and further deflect said laser beam onto said moving web of material;

d. means to pivot said first pivotable mirror; and

e. means to pivot said second pivotable mirror,

and wherein the pivot axes of said first and second pivotable mirrors are parallel to each other and located in a plane parallel to the plane of said moving web of material.

4,049,946

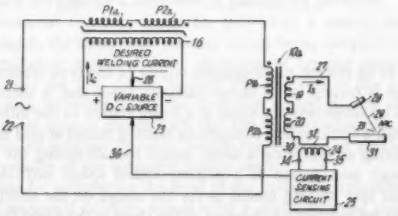
POWER SUPPLY FOR ELECTRIC ARC WELDING

Jean-Louis Fluckiger, and Pierre Alfred Roulet, both of Sao Paulo, Brazil, assignors to Eutectic Corporation, Flushing, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,537

Int. Cl.² B23K 9/10

U.S. Cl. 219—131 R **1 Claim**



1. A power supply for use in electric arc welding, comprising:

a transformer having a center tapped primary winding and a secondary winding;

a pair of conductors for coupling said secondary winding to

an arc welding arrangement comprising an arc welding electrode and a conductive member;

current sensing means coupled to at least one of said conductors for providing a signal dependent upon the current flowing through said arc welding arrangement;

means for coupling the ends of said primary winding remote from said center tap to an alternating current power source;

a saturable reactor having a control winding and an output winding coupled to said primary winding, one end of said control winding being connected to the center tap of said primary winding;

a first thyristor having two main electrodes and a control electrode, one main electrode of said thyristor being coupled to a corresponding end of said primary winding and the other main electrode of said thyristor being coupled to the other end of said control winding;

a second thyristor having two main electrodes and a control electrode, one main electrode of said second thyristor being coupled to the other end of said primary winding and the other main electrode of said second thyristor being coupled to said other end of said control winding;

a phase control circuit for providing firing pulses to the control electrodes of said first and second thyristors in timed relation with the alternations of said power source, and

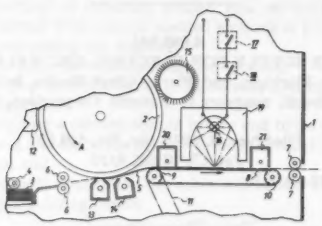
control circuit modifying means coupled to said current sensing means for disabling said phase control circuit to prevent said pulses from being applied to said control electrodes when the current flowing through said arc welding arrangement is less than a predetermined value.

4,049,947

METHOD AND ARRANGEMENT FOR PROTECTING SHEETS FROM CHARRING IN COPYING MACHINES

Friedrich Bestenreiner, Grunwald, and Dieter Giglberger, Unterhaching, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Mar. 10, 1976, Ser. No. 665,383
Claims priority, application Germany, Mar. 15, 1975, 2511423
Int. Cl.[2] H05B *1/00;* **G03G** *15/00, 13/00*
U.S. Cl. 219—216 **10 Claims**



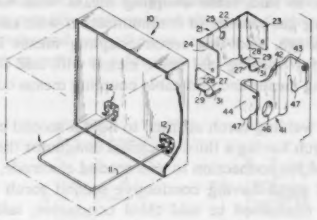
1. In an electro-photographic copier of the type wherein an image is formed on a image-carrying sheet and is thereafter fixed by subjecting the sheet at a fixing station to the influence of heat, a combination comprising heating means at said station for fixing an image on a sheet; means for advancing the sheet through said station at a predetermined speed sufficient to permit said heating means to fix the image on the sheet; and means for preventing charring of the sheet in the event that the latter is advanced through said station at a speed lower than said predetermined speed, said preventing means including a timing switch set at a predetermined time duration sufficient to permit said advancing means to advance the sheet at said predetermined speed through said station, and operative for automatically de-actuating said heating means after said predetermined time duration has elapsed.

4,049,948

OVEN HAVING AN ELECTRIC HEATING ELEMENT WITH A HINGED SUPPORT

Robert V. Gilreath, Cookeville, Tenn., assignor to Still-Man Mfg. Company, Cookeville, Tenn.

Division of Ser. No. 566,739, April 10, 1975, Pat. No. 3,984,003.
This application May 14, 1976, Ser. No. 686,277
Int. Cl.[2] F27D *11/02*
U.S. Cl. 219—404 **3 Claims**



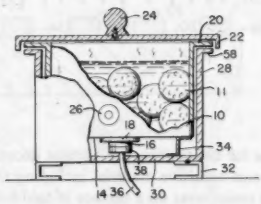
1. In combination with an oven, having an electric heating element, a first bracket attached to an interior wall of the oven; a second bracket supporting said electric heating element, said second bracket being pivotally connected to said first bracket for supporting and moving the heating element between a horizontal position and a tilted elevated position, said first bracket including at least one outwardly extending resilient leg portion, the outer portion of said resilient leg portion including a holding portion; said second bracket including at least one projecting portion in sliding engagement with said resilient leg portion, said projecting portion exerting a force to flex the resilient leg portion with the heating element in a horizontal position, and in moving the heating element to an elevated tilted position, said projecting portion sliding outwardly along said resilient leg portion and into the holding portion to release the flexing force on said resilient leg portion whereby the projecting portion is releasably latched in said holding portion to releasably maintain the heating element in the tilted position.

4,049,949

GOLF BALL WARMER

Ron Fitzsimons, 5557 Fleming Street, Vancouver, B.C., Canada

Filed May 1, 1975, Ser. No. 573,418
Int. Cl.[2] H05B *3/06*
U.S. Cl. 219—521 **4 Claims**



1. A golf ball heater comprising (1) an open ended walled housing having four side wall portions and a bottom wall, said housing adapted to confine a body of water and a plurality of loose golf balls therein, an electric heating means in said housing, an electrical receptacle disposed on said bottom wall, said heating means in electrical communication with said receptacle, said heating means adapted to elevate the temperature of said body of water to about 100°-110° F, illuminating means for providing light to the interior of said housing, said illuminating means including a source of illumination disposed on and integral with one of said side walls, removable cover

means for closing said open ended walled housing, said cover means including a transparent portion centrally located in said cover means, whereby the combination of said source of illumination and said transparent portion permits viewing of said golf balls while they are being heated, and (2) a second walled housing adapted to slidably, removably accommodate insertion of said first housing therein, an electrical wire terminating in electrical plug means at each end thereof, one of said plug means adapted to be connected to a source of electrical potential, the other plug means adapted to engage said receptacle whereby a circuit is created and said heating element is actuated, said water heated and in turn said golf balls are heated.

4,049,950

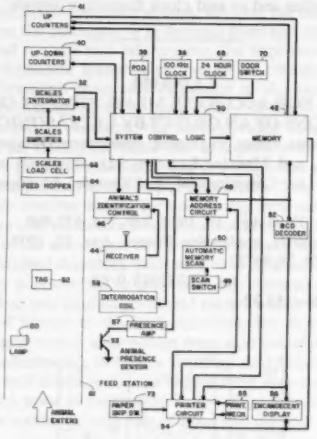
ANIMAL FOOD CONSUMPTION MONITOR

John A. Byrne; Charles K. Rhea, Jr., and Thomas F. Fleming, all of Cookeville, Tenn., assignors to Universal Identification Systems, Inc., Cookeville, Tenn.

Filed Sept. 29, 1975, Ser. No. 617,938

Int. Cl.[2] G06K *7/08;* A01K *5/02*

U.S. Cl. 235—61.6 R **9 Claims**



1. Apparatus for determining and registering the amount of food consumed by each of a plurality of animals comprising a feed station, a scale located at the feed station, a feed hopper containing food mounted on the scale, presence sensing means for sensing the arrival and departure of an animal to and from the feed station, scale weight measuring means connected to the scale and responsive to the actuation of said presence sensing means for determining the amount of food in the hopper, identification means responsive to activation of the presence sensing means by the arrival of the animal to determine the identity of the given animal, consumption measuring means responsive to the scale weight measuring means for determining the increment of food consumed by the animal between its arrival and departure, memory means for storing the cumulative totals of food consumed by each animal individually, additive means responsive to said consumption measuring means for determining and storing in the memory means the cumulation of the previous consumption total stored in the memory means plus said increment of food determined by the consumption measuring means, memory address means responsive to the actuation of said presence sensing means upon the departure of said animal from said feed station and responsive to the identity determined by said identification means for connecting the additive means into that portion of said memory means corresponding to the given animal, means responsive to actuation of the additive means and the completion of its function for returning the consumption measuring means and the identification means to their initial states in preparation for the next animal entry, register means connected to said memory means and intermittently operable to recall and register the identity and corresponding amounts of food consumed by each animal individually as stored in the memory means, said identification means including an electromagnetic coil located at the feed station and responsive to the actuation of the presence sensing means by the animal's arrival for providing electromagnetic pulses, identity means on each animal, each identity means including an internal source of power for the identity means, a transmitter tuned to a specific frequency assigned to the given animal, magnetically responsive reed switch means normally open but closable in response to electromagnetic pulses from said electromagnetic coil to power said transmitter in said identity means, a receiver at the feed station for receiving the transmission of said identity means, a frequency sensitive means in said receiver to determine which of the plurality of identity means is transmitting, and identification storage means connected to said receiver for storing in said storage means the identity determined by said frequency sensing means.

4,049,951

DATA RETENTION APPARATUS

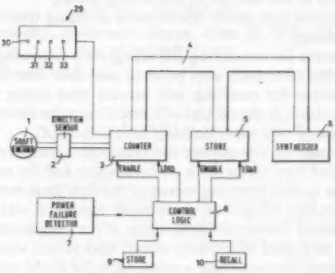
Charlton Robert Baty, Dartford, and Alfred John Jarvis, Walderslade, both of England, assignors to Decca Limited, London, England

Filed Nov. 6, 1975, Ser. No. 629,572

Claims priority, application United Kingdom, Nov. 7, 1974, 48156/74

Int. Cl.[2] G06M *3/14;* H03K *21/34*

U.S. Cl. 235—92 FP **13 Claims**



1. Tuning apparatus including:

a rotatable tuning shaft;

encoding means for providing a first output signal for each unit of rotation through which the shaft rotates;

means for sensing a direction of rotation of the shaft;

directional counter means for providing a tuning output signal, the directional counter means being coupled to the encoding means and the direction of sensing means to count the first output signals, the direction of the count being determined by the direction sensed by the directional sensing means such that the instantaneous count in the directional counter means represents the rotational position of the rotatable tuning shaft;

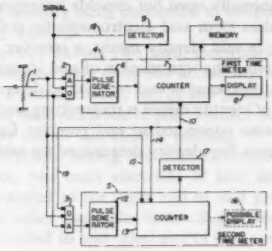
means for comparing the level of the voltage supplied to the directional counter means with a predetermined voltage level; and,

data storing means responsive to the comparing means for storing the output signal of the directional counter means when the voltage level falls below the predetermined level and for loading the stored output signal into the directional counter means when the voltage level subsequently rises above the predetermined level.

4,049,952
INTERMITTENCE-RESPONSIVE WORKING-TIME INDICATOR

Erik Ejnar Forsslund, Ekensbergsvagen 85, 171 45 Solna, Sweden

Filed May 3, 1976, Ser. No. 682,862
Claims priority, application Sweden, May 16, 1975, 7505631
Int. Cl.[2] G06M 3/02; G07C 3/04
U.S. Cl. 235—92 T **6 Claims**



1. An intermittence-responsive working-time indicator comprising in combination

I. a first time meter operative as a working-time meter and including

a. means for measuring and indicating the duration of a single period between a start pulse and a subsequent stop pulse supplied to said first meter as well as the total duration of an arbitrary number of insterspaced such periods while neglecting the intervals between them, and

b. means for resetting said first time meter to a zero position at the receipt of a resetting pulse,

II. a second time meter operative as an idling-time meter and including

a. means for measuring the idling-time following immediately after each stop pulse to said first time meter, and

b. means for resetting said second time meter to a zero position at the receipt of a resetting pulse through either one of two separate reset inputs thereof,

III. means for comparing the idling-time measured by said second time meter with a stored value and for supplying a pulse to said resetting means of the first time meter as well as to one of said separate reset inputs of said resetting means of the second time meter at the very moment when the measured idling-time equals said stored value,

IV. means for supplying a resetting pulse to the other one of said separate reset inputs of said resetting means of the second time meter at the receipt of each start pulse to said first time meter, and

V. means for starting the operation of said second time meter whenever a stop pulse is received by said first time meter, and for stopping the operation therof whenever it has become properly reset by a resetting pulse supplied to either one of its reset inputs.

4,049,953
COMPLEX PULSE REPETITION FREQUENCY GENERATOR

Albert B. Evans, Jr., Ventura, Calif., assignor to The United States of America, as represented by the Secretary of the Navy, Washington, D.C.

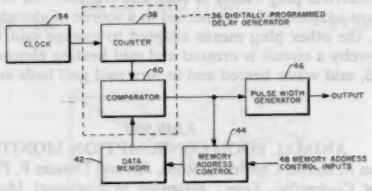
Filed June 24, 1976, Ser. No. 699,820
Int. Cl.[2] G01S 7/30; G06F 15/20
U.S. Cl. 235—150.3 **13 Claims**

1. A complex pulse repetition frequency generator for generating a pulse repetition frequency signal having programmable stagger intervals comprising:

a. clock means for generating a plurality of standard clock frequency signals;

b. memory address control means for generating a plurality of memory address signal sequences, each said memory address signal sequence having a start address and a stop address;

c. data memory means for producing a series of stagger data pulses in response to each said memory address signal sequence; and,

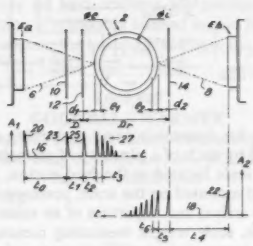


d. digitally programmable delay generating means for producing a pulse repetition frequency signal having stagger intervals generated in response to said series of stagger data pulses and to said clock frequency signals.

4,049,954
DEVICE FOR ACCURATE MEASUREMENT OF THE DIMENSIONS OF AN OBJECT BY ULTRASONIC WAVES

David Da Costa Vieira, Puyricard; Jean-Pierre Dufayet, Aix-en-Provence, and Maurice Lemaire, Manosque, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 19, 1976, Ser. No. 677,888
Claims priority, application France, Apr. 22, 1975, 75.12463; Mar. 9, 1976, 76.06727
Int. Cl.[2] G01S 9/68
U.S. Cl. 235—151.32 **10 Claims**

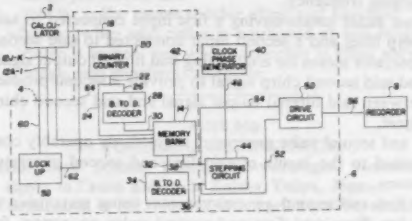


1. A device for the accurate measurement of dimensions of an object by ultrasonic waves, wherein said device comprises at least one ultransonic probe which operates as a transmitter-receiver for ultrasonic pulses, at least two reflecting barriers for said ultrasonic pulses, said barriers being in precisely fixed locations on the path of the ultransonic pulses so as to provide only partial obstruction of said path, means for placing, in a less obstructed portion of said path, an object whose dimensions are to be measured in the direction of propagation of the ultrasonic pulses, means for producing electric signals proportional in value to the time intervals between the reception on each probe of the various echoes corresponding to the reflections of the ultrasonic pulses from said barriers and from said object, and electronic processing means for comparing electric signals proportional to the interval between echoes corresponding to reflections from two of said barriers with electric signals proportional to the interval between echoes corresponding to reflection from different surfaces of said object and for thereby producing electric signals proportional to dimensions of said object.

4,049,955
TEMPORARY MEMORY FOR CALCULATOR-RECORDER SYSTEM

Hal Harris, and Joseph S. Foreman, Jr., both of Dallas, Tex., assignors to Campbell Taggart, Inc., Dallas, Tex.

Filed Mar. 3, 1976, Ser. No. 663,288
Int. Cl.[2] G06F *3/06*
U.S. Cl. 235—152 **17 Claims**

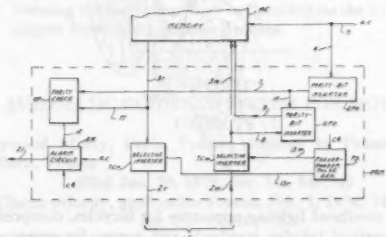


1. In a calculator-recorder system, wherein the output information from the calculator is in decimal form and the recorder receives and records said information, the improvement comprising; information transmission means for transmitting said output information from said calculator to the input of said recorder, including; memory bank means for temporary storing said output information, the memory bank means having nine stages for storing the numerical data portion of the output information from the calculator and two stages for storing the function data portion of the output information from the calculator; binary counter means for converting said output information from said calculator to information in binary form prior to storage in the nine stages of the memory bank; and a pair of binary to decimal decoders, said numerical data information in binary form is converted to information in decimal form after retrieval from said nine stages of said memory bank by a first of said pair of binary to decimal decoders, the function data portion of said output information from said calculator is converted to information in binary form by said binary counter means and said function data in binary form is reconverted to decimal form prior to the storage in two stages of said memory bank by the second of said pair of binary to decimal decoders.

4,049,956
METHOD OF AND MEANS FOR IN-LINE TESTING OF A MEMORY OPERATING IN TIME-DIVISION MODE

Wouter Martinus Dirk Van Veen, San Maurizio Canavese, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Oct. 8, 1976, Ser. No. 730,723
Claims priority, application Italy, Oct. 8, 1975, 69494/75
Int. Cl.[2] G11C *29/00*; G06F *11/10*
U.S. Cl. 235—153 AC **12 Claims**



1. A method of testing the performance of a multistage memory whose stages are periodically addressed in respective time slots of a recurrent scanning cycle, each time slot being divided into a reading phase and a writing phase, for inscribing an incoming multibit data word in an addressed memory stage during a writing phase and retrieving an inscribed data word from an addressed memory stage during a reading phase of any time slot, comprising the steps of:

generating, during certain scanning cycles selected in a generally stochastic manner, inversion commands for replacing the bits of said incoming words by their complements at a location upstream of said memory prior to inscribing said incoming words in the respective memory stages;

supplementing said incoming data words, between said upstream location and said memory, with party criteria written along with said data words in the respective memory stages;

replicating said inversion commands at a location downstream of said memory for reinverting inverted data words retrieved from said memory stages;

replicating said inversion commands at a location downstream of said memory for reinverting inverted data words retrieved from said memory stages;

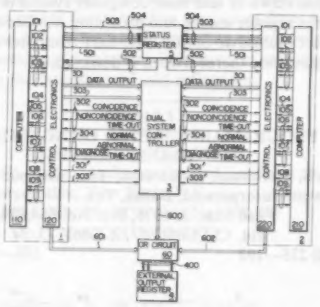
performing a parity check on retrieved data words between said memory and said downstream location; and

generating an alarm signal upon a recurrent negative outcome of said parity check in any bit position in homologous time slots of consecutive scanning cycles.

4,049,957
DUAL COMPUTER SYSTEM

Kazuo Kera; Yutaka Kubo, and Hirokazu Ihara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 512,971, Oct. 7, 1974, abandoned, which is a continuation of Ser. No. 395,012, Sept. 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 264,509, June 20, 1972, abandoned. This application July 18, 1975, Ser. No. 597,174
Claims priority, application Japan, June 23, 1971, 46-44796
Int. Cl.[2] G06F *11/00*
U.S. Cl. 235—153 AK **6 Claims**



1. A dual computer system comprising a main computer system having means for computing control data to be outputted to an external output register, means for running a diagnose routine stored in an internal memory provided in said main computer system, means for changing over the operation mode of said main computer system from a parallel operation mode to either an independent operation mode or a shut-down mode; a subsidiary computer system having means for computing control data to be outputted to said external output register, means for running a diagnose routine stored in another internal memory provided in said subsidiary computer system, and means for changing over the operation mode of said subsidiary computer system from a parallel operation mode into either an independent operation mode or a shut-down mode; first memory means connected to an output of said main computer system for storing the result of an operation performed by said

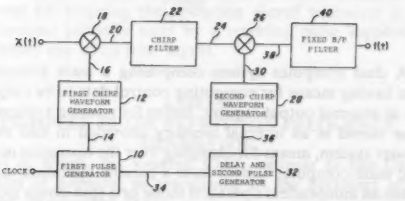
main computer system; second memory means connected to an output of said subsidiary computer system for storing the result of an operation performed by said subsidiary computer system; first comparing means for comparing the content of said first memory means with that of said second memory means and for providing an output signal to initiate the outputting of the content of either of said first and second memory means when coincidence therebetween is detected, and for providing another output signal to initiate the running of the diagnose routine through each of said main and subsidiary computer systems when non-coincidence therebetween is detected; third memory means for storing predetermined information for determining whether or not said main and subsidiary computer systems are functioning correctly by using said predetermined information as a reference for comparison with the respective information stored in said first and second memory means, said information stored in said first and second memory means representing the respective outputs of the main and subsidary computer systems when said computer systems have performed the diagnose routine; second comparing means for comparing the content of said third memory means with the result of checking with the diagnose routine run through said main computer system thereby providing an output signal for immediately placing said main computer system in independent operation when coincidence therebetween is detected, and providing another output signal to instruct shut-down of said main computer system when non-coincidence therebetween is detected; status register means connected to said main and subsidiary computer systems for storing either a first or second output signal from said main computer system for indicating when said main computer system is operating in the independent operation mode or shut-down mode respectively; and third comparing means for comparing the content of said third memory means with the result of checking with the diagnose routine run through said subsidiary computer system thereby providing an output signal to instruct said subsidiary computer system to read the content of said status register means when coincidence therebetween is detected and to place said subsidiary computer system in independent operation only when shut-down of said main computer system is registered in said status register means, and providing another output signal to instruct shut-down of said subsidiary computer system when non-coincidence therebetween is detected.

4,049,958

PROGRAMABLE FILTER USING CHIRP-Z TRANSFORM

Clinton S. Hartmann, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 3, 1975, Ser. No. 554,884
Int. Cl.[2] G06G 7/19; G06F 15/34
U.S. Cl. 235—193 **20 Claims**



1. A device for performing transform operations on an input signal, said device comprising:

a first acoustic surface wave generator means for providing a first chirp signal having a substantially linearly varying frequency,

first mixer means having a first input adapted to receive the input signal and a second input connected to said first generator means for multiplying said input signal and said first chirp signal to provide a first product between said input signal and said first chirp signal,

an acoustic surface wave chirp filter connected to the output of said first mixer means and responsive to said first product to provide an impulse response having a substantially linearly varying frequency as a filtered output signal,

a second acoustic surface wave generator means for providing a second chirp signal having a substantially linearly varying frequency,

second mixer means having a first input connected to said chirp filter and a second input connected to said second generator means for multiplying said filtered output signal and said second chirp signal to provide a second product between said filtered output signal and said second chirp signal,

first and second pulse generators respectively operably connected to the inputs of said first and second generator means,

said first and second generator means being responsive to pulses from said first and second pulse generators for producing said first and second chirp signals,

said second pulse generator being connected to the output of said first pulse generator and being provided with delay means for producing a pulse output to said second generator means at a fixed time delay after receiving a pulsed output from said first pulse generator such that said second chirp signal provided by said second generator means lags said first chirp signal provided by said first generator means by a predetermined time delay, and

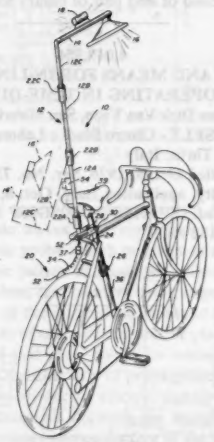
a bandpass filter connected to the output of said second mixer means and responsive to said second product for selecting a desired band of frequencies from said second product.

4,049,959

OVERHEAD BIKE LIGHT

Robert S. Ledterman, 6924 Stella Link, Apartment 34, Houston, Tex. 77025

Filed Sept. 5, 1975, Ser. No. 610,580
Int. Cl.[2] B62J 5/00; F21V 21/08
U.S. Cl. 240—7.55 **3 Claims**



1. An overhead lighting apparatus for bicycles, comprising:

a. a vertical tubular standard, and means for removably attaching said standard to the frame of a bicycle behind the seat thereof;

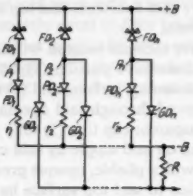
b. said standard having a forwardly projecting portion supporting a lamp fixture adapted to throw light downward onto the head and shoulders of the rider;

c. power means, control means and conductor means passing through the inside of said standard;
d. means for rapidly and simply inserting and removing said standard from said attaching means;
e. a plurality of hinge means spaced along said standard, each of said hinge means comprising
tongue means on one member;
U shaped yoke means on the other member;
hinge pin means; and
tubular collar means slidable along said standard;
whereby when said collar is positioned at said hinge, said hinge is locked, and when said collar is lifted above said hinge, said members can rotate.

4,049,960
FOCUSING ARRANGEMENT

Hansrichard Schulz, Villingen-Schwenningen, Germany, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 463,690, April 24, 1974, abandoned.
This application Nov. 18, 1975, Ser. No. 633,099
Int. Cl.² G01J *1/20*; H01J *39/12*
U.S. Cl. 250—201 **46 Claims**



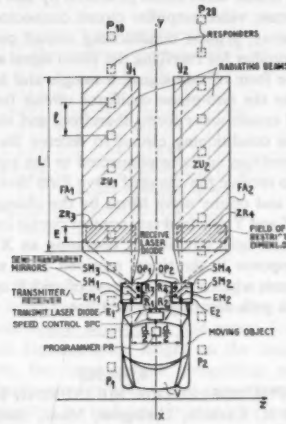
1. A detecting circuit for detecting the sharpness of an image formed by an image forming optical system, comprising:
A. a plurality of photosensitive members having semiconductor junctions of opposite conductivity, said members being disposed in a coplanar mosaic arrangement, said photosensitive members emitting respective electrical outputs in response to the intensity of illumination of the members by respective portions of the image formed by the image forming optical system;
B. a plurality of resistors having respective constant resistance values, a plurality of coupling means each individually connecting one of said resistances in series with a respective one of said members to form respective series circuits exhibiting signal values at the coupling means, the signal values varying between a minimum extreme signal value and a maximum extreme signal value,
i. each of said circuits being connected in parallel with one another;
C. comparing means electrically coupled to said coupling means for producing an output in response only to the one of the extremes of the signal values, whereby the sharpness of the object image formed by means of the image forming optical system may be detected on the basis of the output from said comparing means.

4,049,961
AUTOMATIC GUIDANCE SYSTEM FOR MOVING OBJECTS

Raymond Marcy, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 30, 1975, Ser. No. 545,749
Claims priority, application France, Feb. 1, 1974, 74.03470
Int. Cl.² G05B *1/00*
U.S. Cl. 250—202 **13 Claims**

1. A system for the automatic guidance of a movable object traveling over a supporting surface along a predetermined path, comprising:
transmitting means on said object for directing radiant energy forwardly and sideways toward said surface in the form of at least one pair of beams intersecting said surface in two substantially rectangular zones of illumination with substantially coextensive major dimensions in the direction of motion of said object, said zones being relatively offset transversely to said direction of motion and lying alongside a centerline of said path;
a series of spaced-apart responders disposed in at least one row parallel to said centerline and close to said surface for reflecting radiant energy of substantially equal intensity from both said beams toward said object as long as said

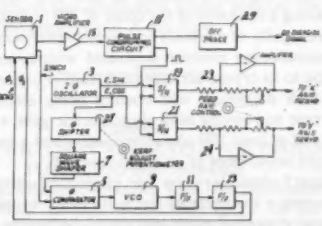


object occupies a normal position athwart said centerline, said zones having a width exceeding that of said row and a length extending over a plurality of responders of said row;
receiving means on said object for separately detecting the reflections of said beams from said responders; and
steering-control means on said object connected to said receiving means for correcting deviations from said centerline, said receiving means including comparison means for ascertaining differences indicative of said deviations between the intensities of said reflections.

4,049,962
LINE EDGE FOLLOWER

George Harold Kallen, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 29, 1976, Ser. No. 709,639
Int. Cl.² G05B *1/00*
U.S. Cl. 250—202 **3 Claims**



1. A line edge tracer system for use with an X-Y coordinate drive machine to cause said machine to follow the path described by the line edge comprising; a circular photo sensor array capable of scanning a field hving a radius determined by an optical system associated with said photosensor arrays; a phase-lock circuit including said photosensor array and a two-

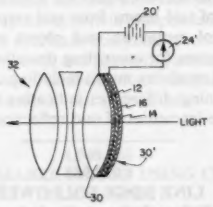
phase oscillator circuit for producing sine and cosine wave forms; a phase comparator circuit connected to said two-phase oscillator circuit, the output of said phase comparator circuit being connected to a voltage controlled oscillator circuit, the output of said voltage controlled oscillator circuit producing clock pulses to sequentially sample the individual photosensitive elements in said photo sensitive array to produce a video output signal and to cause said photo sensor to emit a sync pulse which is fed back to said phase comparator circuit to synchronize the angular position of said veido pulses with the sine and cosine wave forms produced by said two-phase oscillator circuit; video amplifier circuit connected to said photosensor array; a pulse conditioning circuit connected to said video amplifier for receiving the video signal and for changing the wave form of said signal; a sample and hold circuit connected to the two-phase oscillator circuit for receiving said sine and cosine wave forms therefrom and also connected to the pulse conditioning circuit to receive the changed wave form therefrom and also connected to the pulse conditioning circuit to receive the changed wave form therefrom to sample the sine and cosine wave forms by the changed wave forms; and an X and Y axis feed rate control circuit connected to such sample and hold circuits for operating an X servo and a Y servo response to the signal received from such sample and hold circuit whereby the resultant of said X and Y movement being the path described by said line.

4,049,963

PHOTOELECTRIC MEASURING DEVICE

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

Continuation of Ser. No. 397,308, Sept. 14, 1973. This application Aug. 24, 1976, Ser. No. 717,169
Int. Cl.[2] H01J *39/12*
U.S. Cl. 250—211 R **5 Claims**



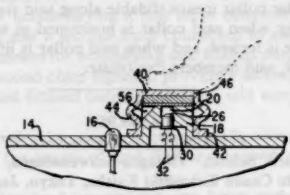
1. A photoelectric measuring device comprising
a substrate of optical material,
a first ohmic layer having a thickness of the order of 50 to 100 A deposited on one surface of said substrate,
a sputter deposited coating on said first ohmic layer and having a thickness of the order of 300 to 3500 A consisting principally of a wholly inorganic, mircrocrystalline, photoconductive material deposited with a vertical orientation to its crystal arrangement relative to the surface upon which deposited, said coating being electrically anisotropic and having high photoelectric gain, a dark resistivity of at least 10^{12} ohm-centimeters and a ratio of dark to light resistivities of at least about 10^4,
a second ohmic layer on said photoconductive coating and having a thickness of the same order as said first ohmic layer deposited upon said photoconductive coating,
said device including substrate, layers and coating having better than 90 percent transmission of radiation at least in the visible spectrum to a degree not materially affecting the integrity of transmission of said radiation through said device and means for detecting current flow between said ohmic layers as a direct quantitative measurement of the radiation passing through, and device.

4,049,964

OPTICAL SWITCHING DEVICE

David G. Wuchinich, New York, and Joseph Tarsia, Valley Stream, both of N.Y., assignors to Cavitron Corporation, New York, N.Y.

Filed Apr. 1, 1976, Ser. No. 672,829
Int. Cl.[2] G01D *21/04*
U.S. Cl. 250—221 **3 Claims**



1. A contactless, electrical switching device, comprising:
a nipple projecting from the surface on which the switching device is mounted and having a top surface, said nipple having a bore that intersects said top surface to provide an opening therein;
a photo-sensitive element located within said bore and having its photo-sensitive portion (1) facing outwardly from the device mounting surface, and (2) operable in response to light received through said opening,
a resilient, transparent cap that (1) fully encloses said nipple, (2) is retained on said nipple by said cap resiliency and (3) has a cover with a pliable, opaque pressure disc retained in spaced-relation to said top surface by said resilient cap to provide an open space between said top surface and said disc that allows light to impinge on said photo-sensitive portion through said opening, said disc being retained in said cover (a) to prevent light from reaching said photo-sensitive upon the application of sufficient pressure to overcome the resiliency of said cap by blocking said opening and (b) to permit light to reach said photo-sensitive portion upon the removal of pressure on said resilient cap, and
utilization means coupled to said photo-sensitive element for taking advantage of the response of said photo-sensitive portion to the presence and absence of light received through said opening.

4,049,965

MEASUREMENT APPARATUS

Robert Martin Pettigrew, Carluke, Scotland, assignor to National Research Development Corporation, London, England

Filed Mar. 6, 1975, Ser. No. 555,818
Int. Cl.[2] H01J *3/14*
U.S. Cl. 250—237 G **23 Claims**

1. An apparatus for measuring displacement of a first member relative to a second member in a manner corresponding to motion with one degree of freedom in a given plane, said apparatus comprising:
a substantially planar grating mounted in a fixed position relative to said first member so as to extend substantially parallel to said given plane, said grating having lines which are spatially periodic in the sense of said motion, the spatial periodicity of said grating in said sense being denoted by f_1;

means for illuminating said grating with light, said illuminating means comprising means mounted in a fixed position relative to said second member and defining a substantially planar optical object which extends substantially parallel to said given plane spaced from said grating and is spatially periodic in said sense, said spatial periodicity of said object in said sense being denoted by f_2 and being at least approximately equal to one half f_1 for causing said grating to form a substantially planar image of said object extending substantially parallel to said given plane at a distance from said grating substantially equal to the distance of said object from said grating, said image being spatially periodic in said sense with a periodicity f_3 in said sense substantially equal to the said object periodicity f_2 and moving in said manner relative to said second member when relative movement in said manner occurs between said first and second members; and

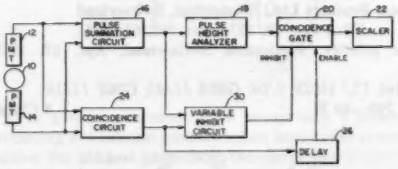
photodetector means responsive to light, said photodetector means comprising means mounted in a fixed position relative to said second member and defining a substantially planar light-receiving array which lies at least approximately in the plane of said image and which is spatially periodic in said sense with a periodicity in said sense at least approximately equal to f_3 for producing at least one signal which varies cyclically by virtue of interaction between said image and light-receiving array when said relative movement occurs between said first and second members.

4,049,966

NUCLEAR RADIATION MEASURING METHOD AND APPARATUS HAVING BLANKING TIME INVERSELY RELATED TO COUNT RATE

Samuel H. Luitwieler, Jr., La Mirada, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed July 2, 1976, Ser. No. 702,253
Int. Cl.² G01T *1/20*
U.S. Cl. 250—369 **6 Claims**



1. A method of inhibiting a measurement of radiation following an overloading radiation surge in a nuclear radiation measuring system which includes apparatus for detecting nuclear radiation and converting same into pulses and for counting the pulses to provide a measure of the nuclear radiation, the method comprising the steps of:

ascertaining the rate at which the pulses are generated;

detecting the occurrence of a radiation surge exceeding a predetermined energy level; and

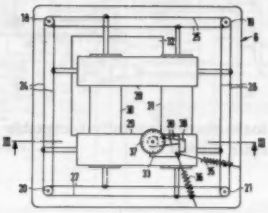
inhibiting the counting of pulses upon the occurrence of the radiation surge for a time period which varies inversely with the ascertained pulse rate.

4,049,967

X-RAY EXAMINING APPARATUS INCLUDING A TOMOGRAPHIC EXPOSURE INSTALLATION

Helmut Berger; Gunther Holzermer; Harry Kirsch, all of Erlangen, Germany, and Pieter Vijlbrief, Leiden, Netherlands, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 12, 1975, Ser. No. 604,079
Claims priority, application Germany, Aug. 21, 1974, 2440146
Int. Cl.² G01N *21/34*
U.S. Cl. 250—445 T **5 Claims**



1. In an X-ray examining apparatus including a tomographic X-ray exposure installation; positioning drive means for effecting laminagraphic height adjustment; and means for making the presently set laminagraphic height on the tomographic X-ray exposures, the improvement comprising: scale dial means having laminagraphic height gradations thereon being operatively connected to said positioning drive means and associated with X-ray film sheets during exposure of the latter so as to mark the area representative of the currently set laminagraphic height on said film sheets; a position indicator connecting said scale dial means with the positioning drive means, said position indicator comprising an elongated casing with a relatively longitudinally displaceable wire therein, connecting said scale dial means with the positioning drive means for the laminagraphic height adjustment; said laminagraphic height gradations on said scale dial means being reproducible through X-rays; and means for supporting the scale dial means and the area representative of the currently set laminagrahic height in adjacency to film-proximate diaphragm means so as to project into the cone of the focused X-rays; said diaphragm means including at least two diaphragm plates; a base plate adjustably supporting said scale dial means, said base plate including a slide member supported on said diaphragm plates for concurrent longitudinal movement along the intersecting location of said two diaphragm plates; said scale dial means comprising a circular scale plate; means for rotatably supporting said scale plate, said scale plate having the laminagrahic gradations on the circumferential edge zones thereof extending above the edges of said diaphragm means defining the X-ray cone and projecting into said X-ray cone.

4,049,968

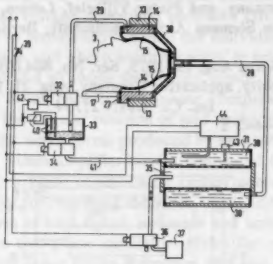
TOMOGRAPHIC X-RAY APPARATUS FOR PRODUCING TOMOGRAPHIC IMAGES

Walter Distler, Erlangen; Roderich Zink, Herzogenaurach, and Gerhard Linke, Erlangen-Frauenaurach, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 4, 1975, Ser. No. 601,706
Claims priority, application Germany, Aug. 5, 1974, 2437710
Int. Cl.² G03B *41/16*
U.S. Cl. 250—445 T **3 Claims**

1. A method of treating a bacterial infection which comprises administering to an animal having said infection an

antibacterially effective quantity of a member selected from the group consisting of gentamicin B, gentamicin B_1, gentami-



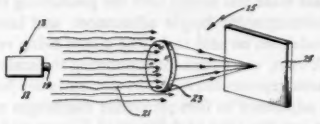
cin X, a non-toxic pharmaceutically acceptable acid addition salt, and a mixture thereof.

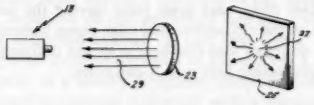
4,049,969

PASSIVE OPTICAL TRANSPONDER

David J. Salonimer, and Buster E. Kelley, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 19, 1970, Ser. No. 24,917
Int. Cl.² F21K *2/00*
U.S. Cl. 250—458 **2 Claims**





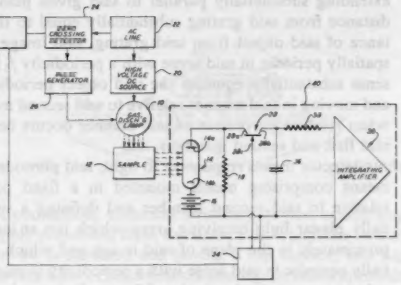
1. In an optical identification and communication system having a combination interrogator and receiver for generating and receiving radiation signals; a passive optical transponder comprising a phosphor device for receiving a converting light from the interrogator, a transponder optic positioned between said phosphor device and said interrogator for collecting and focusing light of a specified wavelength from the interrogator onto the surface of said phosphor, thereby converting the light from the interrogator to a different wavelength and re-transmitting the converted light along the same path back to the receiver in a beam that is re-collimated by said transponder optic, allowing a response light of a different color from the interrogator light to be used to locate and identify friendly forces.

4,049,970

PULSED RADIATION DETECTOR SYSTEM

Michael Alan Ford, Maidenhead, England, assignor to Perkin-Elmer Limited, Beaconsfield, England

Filed Jan. 20, 1976, Ser. No. 650,635
Claims priority, application United Kingdom, Jan. 21, 1975, 02485/75
Int. Cl.² G01N *21/38*
U.S. Cl. 250—461 B **10 Claims**



2. A pulsed radiation detector system comprising, in combination:

a. a source of radiation for irradiating a sample to fluorescence;

b. means, including control means, for intermittently energizing said radiation source to cause fluorescent emissions by said sample of radiation flashes having a duration which is short in comparison to the intervals between flashes;

c. radiation detection means positioned to receive radiation from said sample and generate an output signal in response thereto;

d. means coupling the output signal of said detection means to a signal utilization channel; and

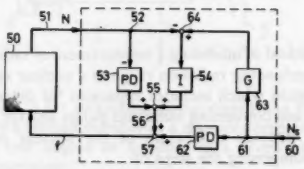
e. switching means associated with said coupling means and operative in timed relation with said control means to interrupt the coupling of said output signal to the utilization channel during periods substantially coinciding with the intervals between flashes.

4,049,971

OUTPUT REGULATOR FOR A THERMAL POWER-PRODUCING PLANT

Dominique le Febve de Vivy, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Jan. 29, 1976, Ser. No. 653,595
Claims priority, application Switzerland, Apr. 17, 1975, 4896/75
Int. Cl.² H02P *9/04*; G05B *11/42*; G06F *15/18*
U.S. Cl. 290—40 R **5 Claims**



1. An output regulator for a thermal power-producing plant comprising

a pair of inputs;

an output for emitting a load control signal;

a first P-member connected to one of said inputs to receive an actual value signal;

an I-member connected to said one input to receive said actual value signal;

a second P-member connected to the other input of said inputs to receive a desired value signal, said second P-member having a smaller transmission factor than said first p-member;

a timing means connected to said other input for receiving and delaying said desired value signal, said timing means being connected to said I-member to emit the delayed desired value signal to said I-member;

an addition means connected to said first P-member and said I-member to receive superimposed signals therefrom, said second P-member being connected to said addition means to deliver said desired value signal to said addition means for addition to said superimposed signals to produce the load control signal in response thereof, said addition means being connected to said output to deliver the load control signal thereto.

4,049,972
TURBO-ALTERNATOR PLANT

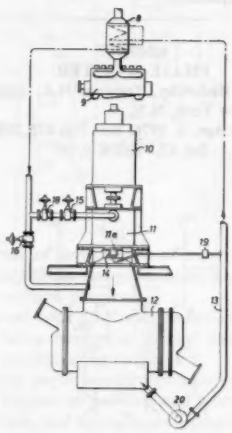
Edmund Porter Crowdy, Newcastle-upon-Tyne, and Hector Fillippus Alexander Drentham-Susman, Barton, both of England, assignors to Hawthorn Leslie (Engineers) Limited, Newcastle-upon-Tyne, England

Filed June 26, 1975, Ser. No. 590,558

Claims priority, application United Kingdom, July 12, 1974, 30962/74

Int. Cl.² F01K *23/10*; F01D *15/10*

U.S. Cl. 290—52 **7 Claims**



1. In a turbo-alternator plant comprising a prime mover producing hot exhaust gases, a waste heat boiler connected to receive the exhaust gases from the prime mover and thereby generating steam, a turbine receiving the steam to be driven thereby, an alternator, each of said turbine and said alternator having a rotor, the rotors being drivingly connected, and a steam condenser connected to receive steam exhausting from the turbine; the improvement, wherein the turbine rotor and alternator rotor are directly connected together and are disposed with the rotational axis of the said rotors vertical, the alternator being above the turbine and wherein there is a bearing arrangement supporting the said rotors including a bearing supporting the weight of their rotors, said bearing being within the environment of said condenser receiving steam exhausting from the turbine, and there being means governing the rotor composite to a speed appropriate to the desired frequency of the alternator output.

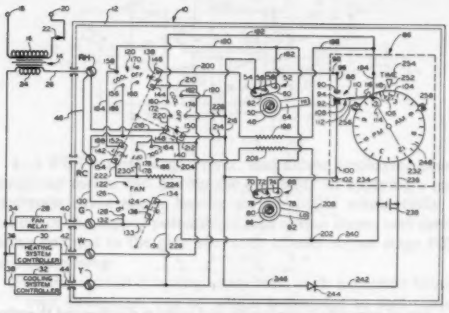
4,049,973
TIMER CONTROLLED SPACE THERMOSTAT WITH BATTERY OPERATED TIMER

Rudolph J. Lambert, Webster Groves, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 26, 1976, Ser. No. 680,142

Int. Cl.² H02J *9/00*

U.S. Cl. 307—66 **8 Claims**



1. In a timer controlled space thermostat for controlling operation of electrically operated space conditioning apparatus, two double-throw temperature responsive switches arranged to move sequentially to a first conductive position in response to a progressing temperature change in one direction and to move sequentially to a second opposite conductive position in response to progressing temperature change in the opposite direction, timer operated switching means including circuit connections for alternately completing an energizing circuit for the operation of space conditioning apparatus through said double-throw switches when in their said first conductive positions, said timer operated switching means including an electrically operated timer movement, a storage battery connected to said timer movement for the energizing thereof, recharging circuit means for said battery completed through said timer operated switching means and one or the other of said double-throw switches when in their said second conductive position, and said double-throw temperature responsive switches having a discrete non-conductive period when moving from their said first to their said second conductive positions during which neither said space conditioning apparatus nor said recharging circuit means are energized.

4,049,974
PRECHARGE ARITHMETIC LOGIC UNIT

Gary W. Boone, and Jerry L. Vandierendonck, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 176,667, Aug. 31, 1971, abandoned. This application Feb. 12, 1974, Ser. No. 441,917

Int. Cl.² H03K *19/08*

U.S. Cl. 307—205 **6 Claims**

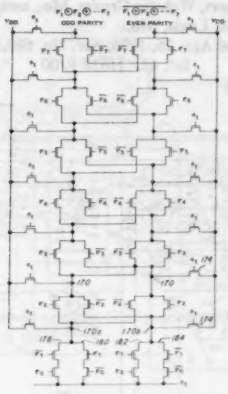
1. A circuit for determining the parity between a plurality of logic signals comprising:

a. first pair of series connected field effect transistors connected between a first node and a first clock voltage source, said transistor having gates for receiving logic signals, and means for applying a first logic signal and the complement of a second logic signal to the gates of the field effect transistors, respectively;

b. a second pair of series connected field effect transistors connected between said first node and said first clock source, said second pair of transistors having gates for receiving logic signals, and means for applying the complement of said first logic signal and said second logic signal to the gates of the second pair, respectively; and

c. means for precharging said first node to a reference nega-

tive voltage simultaneously with applying said first and second signals whereby when said first and second signals



are of opposite logic levels said node is discharged thereby producing at said node a logic 1 level corresponding to uneven parity.

4,049,975

TRANSISTOR CIRCUITS

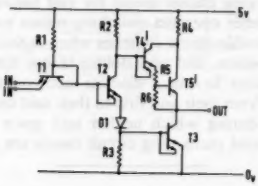
Stephen Francis Colaco, Sale, England, assignor to Ferranti Limited, Hollinwood, England

Filed Dec. 21, 1976, Ser. No. 752,889

Claims priority, application United Kingdom, Dec. 23, 1975, 52680/75

Int. Cl.² H03K *19/08*

U.S. Cl. 307—213 **6 Claims**



1. A transistor-transistor logic circuit arrangement having NPN transistors, and to be energised by a potential supply of at least 4.5 volts, including a multi-emitter input transistor, having an emitter individually connected to each required input for the circuit arrangement, the base is connected via a resistor to a first rail to be maintained at a first, finite positive potential level, the collector is connected to the base to reduce, in the operation of the circuit arrangement, the concentration of stored charge carriers within the transistor, and the collector is also connected to a phase splitter stage connected between the first rail and a second rail to be maintained at a second potential level, less positive than the potential level of the first rail, a diode is provided within the phase splitter stage, and is connected between the input transistor and the second rail to ensure that the input threshold level of the circuit arrangement is above the potential level of the second rail by substantially the maximum obtainable potential difference across two forward biased diodes, one output of the phase splitter stage is connected to the base of an output transistor for the circuit arrangement, the emitter of the output transistor is connected to the second rail, and the other output of the phase splitter stage is connected to a pull-up stage for the output transistor.

4,049,976

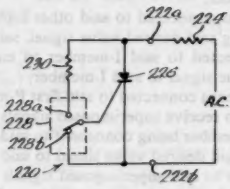
SOLID-STATE VOLTAGE SWITCHING CIRCUIT

Joseph E. Pascente, 71 Regent Drive, Oak Brook, Ill. 60521

Filed May 7, 1976, Ser. No. 684,410

Int. Cl.² H03K *17/72*

U.S. Cl. 307—252 T **17 Claims**



1. In a voltage switching circuit for receiving a voltage across a pair of terminals and having a thyristor for selectively establishing a circuit path therebetween, said thyristor having an anode connected to one of said terminals, a cathode connected to the other of said terminals and a gate, including switch means actuable between two states for directly connecting and short circuiting said gate to said cathode and isolating said gate from said anode in a first state to render said thyristor nonconductive and for connecting said gate to said anode and isolating said gate from said cathode in a second state to render said thyristor conductive, whereby said thyristor requires a decreased gate turn on current to be rendered conductive and when conductive establishes said circuit path, and when nonconductive interrupts said circuit path and has an increased *dv/dt* withstand capability.

4,049,977

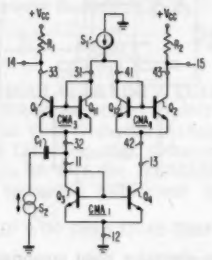
PHASE-SPLITTER

Jonathan Samuel Radovsky, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 8, 1976, Ser. No. 675,258

Int. Cl.² H03K *4/00*

U.S. Cl. 307—262 **7 Claims**



1. The combination of:

a current mirror amplifier having an input terminal, an output terminal, and a common terminal, connected at its common terminal to a point at a reference potential;

first and second loads;

a terminal for an operating voltage;

first and second transistors of the same conductivity type, each having base and emitter and collector electrodes;

a connection of the emitter electrode of said first transistor to the input terminal of said current mirror amplifier;

a connection of the collector electrode of said first transistor through said first load to said terminal for said operating voltage;

a connection of the emitter electrode of said second transistor to the input terminal of said current mirror amplifier;

a connection of the collector electrode of said second transistor through said second load to said terminal for said operating voltage;

current generator means coupled to the base electrodes of said first and said second transistors for supplying them quiescent base currents;

bidirectional coupling means between the base electrodes of said first and said second transistors for exchanging their respective base current variations between them; and

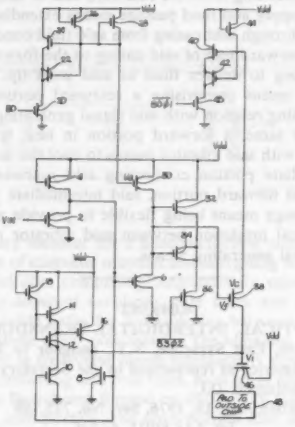
means for applying an input signal to the connection of the emitter electrode of said first transistor and the input terminal of said current mirror amplifier.

4,049,978

MOS HIGH CURRENT DRIVE CIRCUIT

Luke William Dru, Santa Ana, and Yun Sheng Hwang, Tustin, both of Calif., assignors to Western Digital Corporation, Newport Beach, Calif.

Filed Jan. 26, 1976, Ser. No. 652,398
Int. Cl.[2] H03K *19/00, 1/00*
U.S. Cl. 307—270 8 Claims



1. A high current drive circuit of the type which is controlled by timing signals and powered by a constant source of direct current voltage, comprising:

first and second boot strap inverter circuits, said boot strap inverters being responsive to said timing signals, each having a corresponding output;

a current drive circuit having inputs coupled to said corresponding outputs of said first and second boot strap inverter circuits, said drive circuit arranged and configured such that in response to said timing signals the maximum outputs from said first and second boot strap inverter circuits are coupled to the output of said drive circuit;

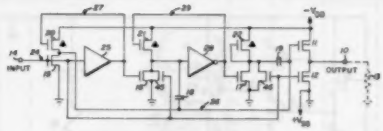
wherein said first bootstrap inverter circuit includes first through fifth metal oxide semiconductor devices, each having gate, source and drain electrodes, said drain electrodes of said first, second and third devices and said gate electrode of said third device being coupled to said source of direct current voltage, said source electrodes of said first and fourth devices and said drain electrodes of said fourth and fifth devices being coupled together, said gate electrodes of said first, second, and fourth devices and said source electrode of said second and third devices being coupled together and forming the output of said first bootstrap inverter, and said gate electrode and source electrode of said fifth device being coupled respectively to one of said timing signals and ground.

4,049,979

MULTI-BOOTSTRAP DRIVER CIRCUIT

Mark S. D. Shieu, San Jose; Robert B. Johnson, Los Gatos, and Ronald C. Laugesen, Sunnyvale, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 24, 1976, Ser. No. 717,428
Int. Cl.[2] H03K *17/10, 4/58, 17/28, 19/40*
U.S. Cl. 307—270 8 Claims



1. A FET output stage driver, said driver employing plural bootstrap means and having the capability of applying a gate electrode drive signal having an amplitude substantially in excess of the supply potential of said output stage, said driver being coupled to the gate electrode of said output stage FET and comprising:

first and second coupling capacitors, each capacitor having two electrodes, one of which is coupled to said output stage gate electrode;

a first tri state FET inverter having an input terminal, an output terminal, and a control terminal, said input terminal being coupled to signal input terminal said output terminal being coupled to said output stage gate electrode;

a FET delay buffer having an input terminal, and output terminal, and a signal delay characteristic such that the signal appearing at said output appears after a first delay interval following an applied input signal, said input terminal being coupled to said signal input terminal, and said output terminal being coupled to said control terminal of said first tri state inverter, whereby said first tri state inverter will respond to an input signal and act as an inverter for the duration of said first delay interval after which said output terminal is rendered floating;

a second tri state FET inverter having an input terminal, an output terminal, and a control terminal, said input terminal being coupled to said output terminal of said delay buffer, and said output terminal being coupled to said second terminal of said first capacitor,

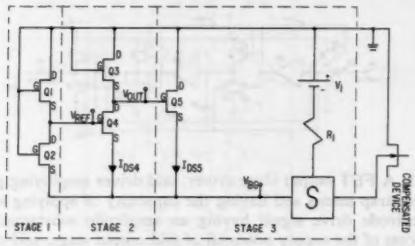
a FET delay inverter having an input terminal, an output terminal, and a signal delay characteristic such that the signal appearing at said output appears after a second delay interval following an applied input signal, said input terminal being coupled to said output terminal of said second tri state inverter and said output terminal being coupled to said control terminal of said second tri state inverter whereby said second tri state inverter will respond to an input signal and act as an inverter for the duration of said second delay interval after which said output terminal is rendered floating; and

a FET inverter having an input terminal and an output terminal, said input terminal being coupled to said output terminal of said delay inverter and said output terminal being coupled to said second terminal of said second capacitor, whereby said first and said second capacitors along with the gate capacitance of said FET output stage all become discharged to V_{SS} when said first tri state inverter input terminal is at logic one signal state, said plurality of capacitors along with said gate capacitance of said FET output stage all charge to a substantial fraction of V_{DD} during said first delay interval after which said input terminal of said first tri state inverter is switched to logic zero state, second capacitor along with said gate capacitance of said FET output stage both charge to a potential that is a substantial fraction of twice V_{DD} during said second delay interval, and said gate capacitance of said FET output stage charges to substantially in excess of twice V_{DD} after said second delay interval.

4,049,980
IGFET THRESHOLD VOLTAGE COMPENSATOR

David Steven Maitland, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 26, 1976, Ser. No. 680,617
Int. Cl.[2] H03K *1/02, 3/353*
U.S. Cl. 307—304 9 Claims



1. A circuit for compensating for variation in the threshold voltage of IGFETs with a common substrate in an integrated circuit, the circuit comprising:

a reference voltage source with first and second terminals;

a first resistive element serially coupled to

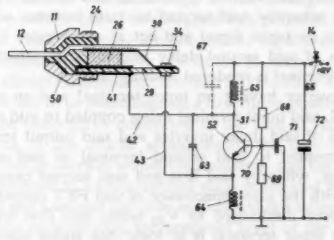
a first IGFET with a gate coupled to the first terminal of said reference voltage source, the serial combination of said first resistive element and said first IGFET being coupled between the second terminal of said reference voltage source and the substrate; and

means for applying a bias voltage to the substrate, said means responsive to a voltage at the couple between said first resistive element and said first IGFET for adjusting the bias voltage to maintain the threshold voltage of the IGFETs in the integrated circuit at desired threshold voltage.

4,049,981
PIEZOELECTRICALLY DRIVEN ULTRASONIC TOOL WITH COOLING

Walter Durr, Bissingen, Germany, assignor to Durr-Dental KG, Germany

Continuation of Ser. No. 450,108, March 11, 1974, abandoned, which is a continuation of Ser. No. 288,887, Sept. 13, 1972, abandoned. This application Dec. 15, 1975, Ser. No. 640,778
Int. Cl.[2] H01L *41/04*
U.S. Cl. 310—317 17 Claims



1. A self-contained hand tool for creating and applying ultrasonic vibration for dental use comprising:

A. handle means comprising a tubular casing of slender elongate form to facilitate holding and manipulation of the hand tool by a user, said casing having a forward end and a rearward end,

B. a vibrator unit comprising piezoelectric vibrator means mounted in a forward portion of said casing, a vibratable work-tip disposed forwardly of the forward end of said casing and means coupling said work-tip with said piezoelectric vibrator means for transmitting vibration from said vibrator means to said work-tip,

C. signal generating means disposed in a rearward portion of said casing for generating an alternating electrical signal of ultrasonic frequency, said generating means being spaced from and mechanical vibrationally insulated from said vibrator means in said forward portion of said casing,

D. circuit means wholly within said casing for electrically connecting said signal generating means with said piezoelectric vibrator means, to apply said ultrasonic alternating electric signal to said piezoelectric vibrator means and thereby excite said vibrator means into ultrasonic oscillation and by such oscillation to produce ultrasonic vibration of said work-tip, said circuit means comprising flexible leads from said generating means to said vibrator means to provide electrical connection but mechanical vibrational insulation between said generating means and said vibrator means,

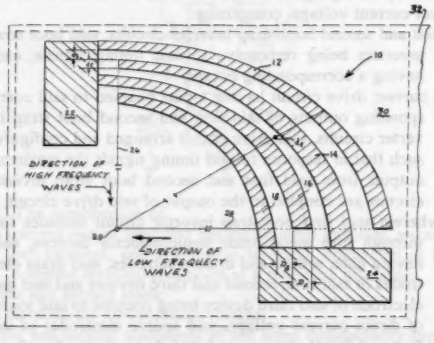
E. electrical conductor means electrically connected with said signal generating means and extending from the rearward end of said casing for supplying low voltage direct current to said signal generating means in said casing, and

F. fluid supply means comprising flexible fluid conduit means extending from the rearward end of said casing to a fluid supply and fluid passage means extending longitudinally through said casing from said fluid conduit means at the rearward end of said casing to the forward end of said casing to deliver fluid to said work-tip, said fluid passage means comprising a rearward portion in heat transmitting relation with said signal generating means to cool the same, a forward portion in heat transmitting relation with said vibrator means to cool the same and an intermediate portion connecting said rearward portion with said forward portion, said intermediate portion of said passage means being flexible to provide mechanical vibrational insulation between said vibrator means and said signal generating means.

4,049,982
ELLIPTICAL, INTERDIGITAL TRANSDUCER

Paul B. Cohen, East Syracuse, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 18, 1976, Ser. No. 715,759
Int. Cl.[2] H01L *41/04*
U.S. Cl. 310—366 7 Claims



1. An elliptical, interdigital transducer comprising a plurality of concentric, elliptically shaped conductive fingers situated within one quadrant of an ellipse and mounted on a piezoelectric material, said fingers having a width and a spacing along the minor axis of said ellipse substantially equal to each other, said fingers having a width and a spacing along the major axis of said ellipse substantially equal to each other, and said width and spacing of said fingers, respectively, along said major axis

being substantially twice the width and spacing of said fingers, respectively, along said minor axis, whereby upon the application of an exitation frequency f_1 to said transducer, a low frequency surface wave of frequency f_1 will propagate along the major axis toward the focus, and upon application of an exitation of frequency f_2, with $f_2 > f_1$, a high frequency surface wave of frequency f_2 will propagate along the minor axis toward the focus, and upon application of exitation frequency f with $f_1 \leqq f \leqq f_2$, a resonance will occur at some point, d_r, on a line through the ellipse and the focus such that $d_r = V/4f$, where V is the characteristic velocity of acoustic waves in said piezoelectric material.

4,049,983

ELECTROMAGNETIC LEVITATION

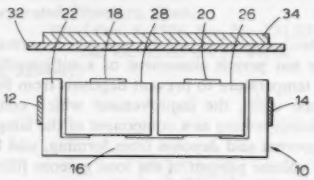
Alan Attwood, Conwy, Wales, and Eric Roberts Laithwaite, Long Ditton, England, assignors to National Research Development Corporation, London, England

Filed Sept. 16, 1975, Ser. No. 613,858

Claims priority, application United Kingdom, Sept. 24, 1974, 41421/74

Int. Cl.² H02K *41/02*

U.S. Cl. 310—13 **7 Claims**



1. A primary member for a linear induction machine comprising a core of magnetic material and energising windings on said core, said core comprising longitudinally spaced sets of four laterally adjacent co-planar pole faces and means arranged to provide paths for working flux between each pole face and all three other pole faces in the same set, said paths being disposed in transverse planes substantially perpendicular to the plane containing said pole faces, each set of four laterally adjacent pole faces being formed on the ends of four limbs of a respective core portion, the core portion also including a backing part interconnecting the ends of the limbs remote from the pole faces, the energising windings being disposed only on the inner two limbs of each set of four laterally adjacent limbs.

4,049,984

ELECTRIC MOTOR

Hirohisa Ishii, Tokyo, and Masami Shishikura, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 13, 1976, Ser. No. 686,075

Claims priority, application Japan, May 22, 1975, 50-61278

Int. Cl.² H02K *15/00*

U.S. Cl. 310—42 **11 Claims**

1. An electrical motor comprising:

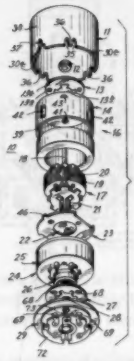
a first cylindrical case having an end wall only at one end thereof with a central bore in said end wall;

a second cylindrical case containing a cylindrical magnet and having an end wall only at one end thereof with a central opening therein, said cylindrical case having an axial length substantially smaller than that of said first cylindrical case and being slidably insertable into said first cylindrical case through the other end of the latter to dispose the end walls of said first and second cases adjacent each other;

a brush base inserted into said first cylindrical case through said other end of the latter so as to bear against the other end edge of said second cylindrical case, said brush base having brush means mounted on the surface thereof facing toward said second cylindrical case, and frequency generating means mounted against the opposite surface of said brush base;

a lid member having a central thrust bearing portion and being shaped to bear axially against said frequency generating means while being engaged with said other end of the first cylindrical case for closing the latter;

means for temporarily holding said lid member in engagement with said other end of the first cylindrical case; and



means for rotationally adjusting said second cylindrical case relative to said first cylindrical case from the exterior of the latter while said lid member is temporarily held in engagement with said first cylindrical case so as to adjust the neutral point of said brush means relative to said cylindrical magnet.

4,049,985

DAMPING DEVICE FOR A STEPPER MOTOR

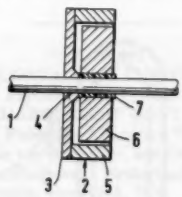
Roland Sudler, Frankfurt am Main, Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed June 14, 1976, Ser. No. 695,460

Claims priority, application Germany, June 18, 1975, 2527046; Aug. 29, 1975, 2538480

Int. Cl.² H02K *37/00*

U.S. Cl. 310—49 R **8 Claims**



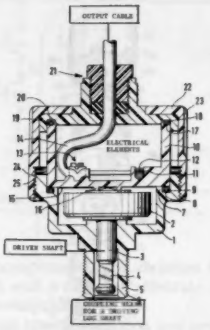
1. In a device for damping the natural oscillations of the permanently magnetized rotor of a stepper motor by means of an inertia mass arranged on the motor shaft, the improvement comprising means for magnetically coupling the rotor and the inertia mass, at least one part of the inertia mass comprising magnetizable material with distinct hysterisis and low coercive force.

4,049,986

ROTATIONAL SPEED TO IMPULSE FREQUENCY CONVERTER

Alois Kreuz, Maintal, Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed Apr. 7, 1976, Ser. No. 674,505
Claims priority, application Germany, Apr. 14, 1975, 2516193
Int. Cl.[2] H02K *11/00*; H01H *9/00*
U.S. Cl. 310—68 B 9 Claims



1. A rotational shaft-speed to impulse-frequency converter, such as for converting the speed of a driving underwater shaft of log into a proportional impulse frequency, comprising:

a. a housing with a shaft orifice with a driven shaft, with means for coupling with an outside driving shaft;

b. a cup-shaped watertight insert mounted within said housing having a base and a cover with a watertight cable orifice and a cable extending therethrough;

c. a permanent magnet mounted for rotation on the driven shaft adjacent the said base of said insert;

d. electrical components, including at least one magnetically actuated switch on the inside of said base of said insert within an effective range of said magnet;

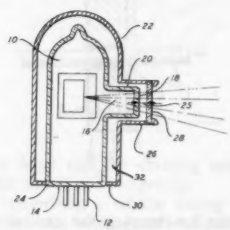
e. said housing, said insert and said cover comprising mounting means for a watertight mating mounting of their respective peripheries. said housing having an open top; said mounting means comprising: a ring shoulder in said housing; said insert supported by said ring shoulder; and a collar ring engaging the outside of said cover and holding said insert in said housing.

4,049,987

OZONE ABSORBANCE CONTROLLER

Charles Carlyle Helms, Trumbull, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed June 4, 1976, Ser. No. 692,658
Int. Cl.[2] H01J *5/16*; H01K *1/34*
U.S. Cl. 313—112 8 Claims



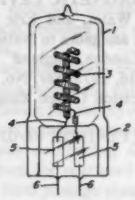
1. An ozone absorbance controller for use with an untraviolet light source comprising a trapped gas filter disposed in an optical emission path of said ultraviolet light source to absorb high energy ultraviolet rays of wave lengths below about 200 nanometers, and to thereby substantially prevent the formation of ozone in said optical emission path subsequent to said filter, said trapped gas filter being vented with a single opening sufficiently large to permit pressure equalization between the gases in the filter and atmosphere yet small enough to prevent gas movement within the gas filter after pressure equalization.

4,049,988

TUNGSTEN HALOGEN LAMP

James P. Keenan, Reading, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Apr. 14, 1976, Ser. No. 676,840
Int. Cl.[2] H01K *1/50*
U.S. Cl. 313—222 3 Claims



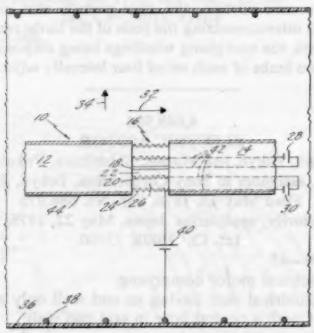
1. In a tungsten halogen lamp of the type where normal lamp operation does not permit attainment of a sufficiently high envelope wall temperature to prevent depositis from forming on the envelope walls, the improvement which comprises providing sufficient helium as a component of the lamp gaseous filling to prevent said deposits from forming, said helium being 20 to 50 volume percent of the total gaseous filling.

4,049,989

ION PRODUCTION MEANS

Robert H. Bullis, and Walter J. Wiegand, Jr., Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 18, 1975, Ser. No. 605,562
Int. Cl.[2] H01J *27/00*
U.S. Cl. 313—230 12 Claims



1. Apparatus for providing ions having a specific electrical polarity to a fluid flowing in a conduit along a flow axis wherein the ions migrate across the fluid in a direction essentially perpendicular to the flow axis and the apparatus comprises:

a main assembly having an outer surface extending along the axis and including,

an upstream section,

a downstream section, and

a center region which separates the upstream and downstream sections;

means for producing ions in the center region;

an ion permeable grid which extends in the axial direction across the center region between the upstream and downstream sections, the grid and the ion producing means defining therebetween an ion acceleration region which is bounded axially at the upstream end by the upstream section and at the downstream end by the downstream section; and

means for applying a first electric field across the ion acceleration region between the ion production means and the ion permeable grid.

4,049,990

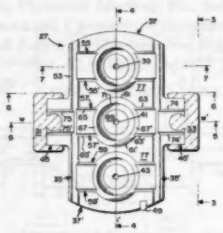
CRT IN-LINE GUN ELECTRODE HAVING STRENGTHENING RIBS

Floyd K. Collins, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 8, 1976, Ser. No. 731,037

Int. Cl.[2] H01J *29/50, 29/82*

U.S. Cl. 313—417 **6 Claims**



1. An improvement in a plural-electrode in-line multi-beam cathode ray tube electron gun assembly integrated by a plurality of longitudinal insulative support members, said improvement comprising:

a substantially planar one-piece electrode member having opposed side and end portions and definitive *l-l'* and *w-w'* axes therein, said member having a plurality of spatially positioned and in-line related apertures therethrough such being oriented in a common plane substantially the *l-l'* axis of said member, one of said apertures being located at the *intersection of said l* and *w* axes, said planar member having at least two opposed supporting projections extending from either side thereof in a positional manner for attachment to said assembly support members, each of the side portions of said electrode member having a substantially longitudinal strengthening bend therein, each of the aperture areas in said member having a pair of rib embossments spatially associated therewith, each of said ribs being substantially formed as a yoke configuration having an intermediate arcuate section from which two extremital sections opposedly extend in a substantially common linear relationship, the arcuate sections of said pair of yoke-formed ribs being oriented in spaced circumferential relationship to a respective aperture, the pair of rib embossments spatially associated with said aperture located at the intersection of said *l* and *w* axes have extremital sections thereof co-extending into the respective opposed supporting projections protruding from the sides of said member to provide strengthening thereto.

4,049,991

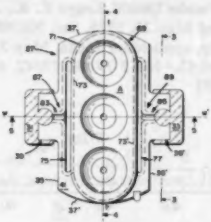
LONGITUDINAL RIB EMBOSSMENT IN TRI-APERTURED, SUBSTANTIALLY PLANAR ELECTRODE

Floyd K. Collins, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 8, 1976, Ser. No. 731,038

Int. Cl.[2] H01J *29/50, 29/82*

U.S. Cl. 313—417 **6 Claims**



1. An improvement in a plural electrode in-line multi-beam cathode ray tube electron gun assembly integrated by a plurality of longitudinal insulative support means, said improvement comprising:

a one-piece electrode member of substantially planar formation having opposed sides and end portions and definitive **1—1'** and *w—w'* axes therein, said member having at least one supporting projection extending from each side thereof to provide positional means for attachment of said member to said assembly supportive means; said member having an alpha planar level from which a plurality of individual longitudinally aligned cup-like shapings are impressed, each of said cups having a formed side wall and a substantially flat bottom with an axial aperture therethrough, the bottoms of said cup being oriented in an omega planar level parallelly spaced from said alpha planar level, said plurality of aligned cups being treated within said member as a longitudinal unitized portion having a continuous turned-perimeter thereabout defining an encompassing rim extending normal to said alpha planar level, the longitudinal sides of said cup-encompassing portion being parallel with said **1—1'** axis, said electrode member having a substantially longitudinal rib embossment formed on either side thereof, with at least one complementary rib projecting outward therefrom in a normal manner to form a rib combination, each of said longitudinal rib embossments being transitionally configurated from the terminal region of the respective longitudinal portion of the turned perimeter of said cup encompassing unit, the complementary rib means of said combination being oriented to extend through each of said supporting projections.

4,049,992

BERYLLIUM-CONTAINING EUROPIUM ACTIVATED PHOSPHATE PHOSPHOR, LUMINESCENT SCREEN AND DISCHARGE LAMP CONTAINING SAME

Judicus Marinus Pieter Jan Verstegen; Willebrordus Hubertus Martinus Maria van de Spijker, and Emiel Petrus Juliaan de Meester, all ofEindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 22, 1974, Ser. No. 472,282

Claims priority, application Netherlands, June 1, 1973, 737627

Int. Cl.[2] C09K *11/46*; H01J *1/63*

U.S. Cl. 313—486 **14 Claims**

1. A luminescent screen provided with a luminescent beryllium-containing phosphate, wherein the phosphate is activated by bivalent europium and is defined by the formula $Me_{a-x}Be_bEu_xP_2O_8$ where $a + b = 3$, $0.01 \leqq x \leqq 0.25$, and b has the

value of 1 or 2 and in which, if $b = 2$, Me represents barium and in which, if $b = 1$, Me represents at least one of the alkaline earth metals selected from the group consisting of barium and strontium.

4,049,993

MULTI-DIGIT FLUORESCENT DISPLAY TUBE WITH INCLINED FILAMENT CATHODE

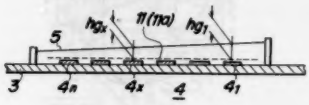
Takao Kishino, and Yukihiko Utamura, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K. K., Japan

Filed May 25, 1976, Ser. No. 689,902

Claims priority, application Japan, May 31, 1975, 50-64835

Int. Cl.[2] H01J *19/08, 19/42, 63/06*

U.S. Cl. 313—497 **5 Claims**



1. A multi-digit fluorescent display tube comprising:

a planar insulating substrate;

a plurality of digit fluorescent displays arranged in a row in spaced side-by-side relationship along the longitudinal width of the planar substrate to form a plurality of planar digit fluorescent displays;

each digit fluorescent display comprising a plurality of segment anodes disposed to selectively form one of a plurality of digits and deposited phosphor layers thereon;

at least one filament cathode stretched along the longitudinal width of the planar insulating substrate adjacent to the plurality of digit fluorescent displays but separated therefrom;

the filament cathode being disposed at an acute angle with respect to the planar insulating substrate so that distances between the filament cathode and each of the plurality of digit fluorescent displays are linearly progressively shorter so that the perveance of each of the plurality of digit fluorescent displays is adjusted so as to illuminate each of the plurality of digit fluorescent displays in uniform brightness when the fluorescent display tube is operated by heating the filament cathode with a direct current power source; and

a light transparent evacuated sealed envelope in which the plurality of digit fluorescent displays and the filament cathode are disposed and through which the plurality of digit fluorescent displays may be viewed externally when the fluorescent display tube is in operation.

4,049,994

LIGHT EMITTING DIODE HAVING A SHORT TRANSIENT RESPONSE TIME

Ivan Ladany, Stockton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 26, 1976, Ser. No. 652,224

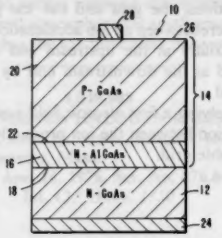
Int. Cl.[2] H05B *33/16*

U.S. Cl. 313—499 **10 Claims**

1. An electroluminescent device, capable of a transient response time of .2 microseconds or less, comprising:

a body of semiconductor material having a first region of aluminum gallium arsenide of N type conductivity contiguous to a second region of gallium arsenide of P type conductivity, said second region having only silicon as the conductivity modifier, said second region having a heterojunction only with said first region, and said second region being of a thickness, extending from said heterojunction, in the range of about 50 to 200 micrometers;

a substrate in contact with a surface of said first region opposite said heterojunction; and



means for electrically contacting said body and said substrate.

4,049,995

RESONANT CAVITY TUBES

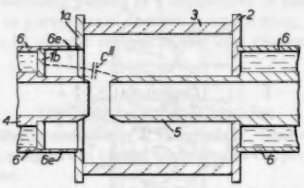
Christopher John Edgcombe, Coton, England, assignor to English Electric Valve Co., Ltd., England

Filed May 6, 1976, Ser. No. 683,780

Claims priority, application United Kingdom, May 7, 1975, 19083/75

Int. Cl.[2] H01J *25/10*

U.S. Cl. 315—5.39 **7 Claims**



1. A klystron type resonant cavity tube comprising two spaced cavity forming walls, a portion of a first drift tube extending through one of said cavity forming walls, a second portion of a drift tube extending through the other of said cavity forming walls, said two drift tube portions extending towards one another along a common axis to end within the cavity of which said walls form part and define a gap therebetween, and at least one of said two cavity forming walls having an inner part through which passes said first drift tube portion and having a radially outer part which is spaced closer along said axis from the end of said second drift tube portion than is said inner part of said one wall, said inner part being spaced axially from said gap by an amount sufficient to mitigate reduction in resonant frequency of the tube caused by the axial dimension of said gap.

4,049,996

CONTROL OF ELECTRONICALLY GENERATED LIGHT PULSES

Zoltan Vital, Uccle, and Jean Orban, Clabecq, both of Belgium, assignors to Ponder & Best, Inc., Los Angeles, Calif.

Division of Ser. No. 358,974, May 10, 1973, Pat. No. 3,943,406, which is a division of Ser. No. 17,634, March 9, 1970, Pat. No. 3,749,921, which is a continuation-in-part of Ser. No. 799,554, Feb. 13, 1969, abandoned. This application May 23, 1975, Ser. No. 580,519

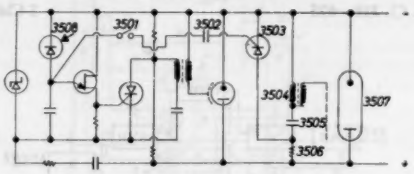
Claims priority, application Belgium, Mar. 7, 1969, 71104; June 27, 1969, 75962; Sept. 22, 1969, 79321

Int. Cl.[2] H05B *41/32*

U.S. Cl. 315—151 **2 Claims**

1. A device for controlling the initiation and duration of

light flashes produced by a light flash tube in response to pulses produced by the discharge of a capacitor and including a light sensitive element arranged for receiving light coming from a given direction and operatively connected to said tube for triggering the production of a light flash by said tube in response to the application of light to said element wherein the improvement comprises a control circuit connected to said light sensitive element and operatively associated with said tube for controlling the duration of the flash produced by said tube in dependence on the quantity of light received by said light sensitive element after the commencement of such flash.

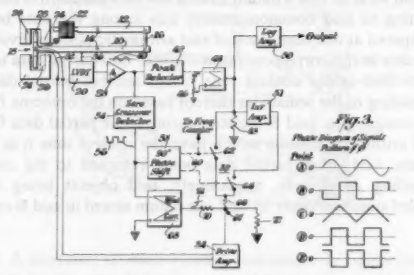


4,049,997

DRIVE FOR DYNAMIC MECHANICAL SYSTEM

John D. McGhee, Plymouth Meeting, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 27, 1976, Ser. No. 662,270
Int. Cl.² H02K *33/00*
U.S. Cl. 318—128 **7 Claims**



1. In a system for driving a dynamic mechanical system at its resonant frequency, said mechanical system having a displacement transducer for providing an alternating signal corresponding to the instantaneous displacement of said mechanical system, a drive transducer for imparting mechanical motion to said system, and drive means responsive to said displacement signal for actuating said drive transducer to maintain said mechanical system oscillating at said resonant frequency and at a constant amplitude, the improvement wherein:

said drive means includes analog means for developing an analog signal related in amplitude to the power required to maintain said amplitude constant,

switching means responsive the the zero crossover times of said alternating displacement signal for selectively actuating said drive transducer with said analog signal to maintain said resonant frequency,

said switching means includes inverting means for inverting the polarity of said analog signal, and

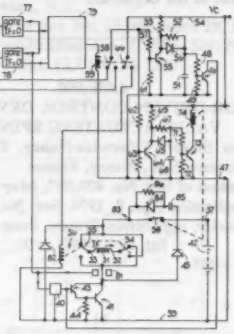
additional switching means responsive to alternate pairs of successive peaks of said displacement signal and to said inverted analog signal for selectively actuating said drive transducer to drive said mechanical system in both senses.

4,049,998

CONTROL CIRCUIT FOR AN ELECTRICALLY DRIVEN VEHICLE

Trevor Charles Boxer, Birmingham, England, assignor to Joseph Lucas Limited, Birmingham, England

Filed Sept. 18, 1975, Ser. No. 614,674
Int. Cl.² H02P *3/12*
U.S. Cl. 318—258 **4 Claims**



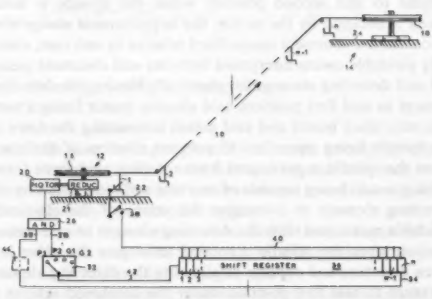
1. A control circuit for an electrically driven vehicle having a battery and a motor with an armature and a separately excited field winding, comprising positive and negative supply lines for connecting the battery to the armature and the field winding, at least one current recirculating diode connected in circuit with the field winding to shunt the field current when the connection between the battery and the field winding is interrupted, a switching mode field current regulator, field current direction control means connected in series with the field winding between the supply lines, switch means connected in the path of the recirculating diode current and means for opening said switch means temporarily when a change of field current direction is required, opening of said switch means causing current flowing in the field winding as a result of collapsing flux therein to be diverted through the vehicle battery so as to increase the rate of decay of said flux above that with the recirculating diode alone thereby allowing rapid reversal of the field current.

4,049,999

SPEED CONTROL SYSTEM FOR A CHAIRLIFT

Bruno Thibaudon, St. Nizier du Moucherotte, France, assignor to Pomagalski S.A., France

Filed July 30, 1976, Ser. No. 710,328
Claims priority, application France, Aug. 14, 1975, 75.25465
Int. Cl.² B61B *10/02*; H02P *7/04*
U.S. Cl. 318—305 **5 Claims**



1. A speed control system for a chairlift having seats hung from an endless cable extending between an embarking station and a disembarking station comprising:

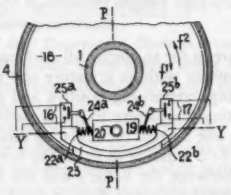
a motor for driving said cable
means for changing the speed of the motor
means for detecting the speed at the passage of a seat in the embarking station
a storage device for storing the speed information received from said detecting means and for restoring this speed information at the arrival of said seat in the disembarking station to automatically reproduce at the arrival the speed of the seat at the departure.

4,050,000

MOTOR-DRIVEN CONTROL DEVICE FOR A VALVE-ACTUATING SPINDLE

Jean Georges Sutter, Villers-les-Nancy, France, assignor to Pont-A-Mousson S.A., Nancy, France

Continuation of Ser. No. 470,097, May 15, 1974. This application Apr. 8, 1976, Ser. No. 675,088
Claims priority, application France, June 1, 1973, 73.20072
Int. Cl.[2] G05D *3/00*
U.S. Cl. 318—468 **10 Claims**



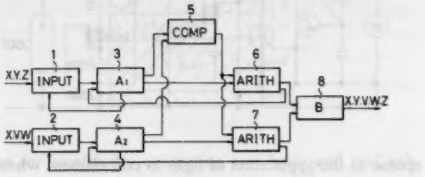
1. In a control device for shifting a closure member of a valve, comprising a case, a spindle rotatably mounted in the case to rotate about an axis for connection to the closure member, an electric motor having a stator and a rotor, means for connecting the rotor to the spindle to rotate the spindle, an electric power supply circuit electrically connected to the motor, means for detecting stoppage of the rotation of the spindle, switching means inserted in said circuit and responsive to the detecting means for opening the supply circuit when the spindle stops rotating, the detecting means comprising a detecting element mounted to be movable with respect to said case transversely of a radial plane containing said axis in a given direction between a first position and a second position, the detecting element being cooperative with the switching means to achieve opening of the supply circuit in said first position and closure of the supply circuit in said second position, and force transmitting means interposed between the spindle and the detecting element for urging the detecting element to said second position while the spindle is being driven in rotation by the motor; the improvement comprising in combintion abutment means fixed relative to said case, elastically yieldable means interposed between said abutment means and said detecting element for elastically biasing the detecting element to said first position, said electric motor being a variable reluctance motor and said means connecting the rotor to the spindle being operative to prevent rotation of the rotor when the spindle is prevented from rotating, said force transmitting means being capable of exerting sufficient force on the detecting element to overcome the action of the elastically yieldable means and shift the detecting element to said second position when the spindle is rotated to actuate the valve in a given direction and capable of allowing the detecting element to return to said first position under the combined actions of the elastically yieldable means and the vibrations of the electric motor when the spindle is prevented from rotating and current is continued to be supplied to the electric motor.

4,050,001

EDIT CIRCUIT FOR A NUMERICAL CONTROL SYSTEM

Hajimu Kishi, and Masashi Takahashi, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 7, 1976, Ser. No. 647,208
Claims priority, application Japan, Jan. 20, 1975, 50-7713
Int. Cl.[2] G05B *11/32*
U.S. Cl. 318—625 **2 Claims**



1. An edit circuit for a numerical control system for a plurality of objects being controlled, which objects have one common control axis, characterized in that said circuit comprises a plurality of input means receiving input data corresponding to said objects, respectively, a plurality of A-registers storing the data from the input means, a comparator circuit comparing the data stored in the A-registers, a plurality of arithmetic circuits operating on the data in the A-registers based on the result of comparison at the comparator circuit, and a B-register combining the operated data from the arithmetic circuits into one series of data for storage therein, said input means receiving input data in response to input timing signals from the corresponding A-registers, said input timing signals being generated when each A-register becomes empty, said data delivered to each of said A-registers being compared at said comparator circuit so as to find a datum having the shortest control time t_1 relating to said common control axis among the data being compared at one time, each of said arithmetic circuits dividing the data in the corresponding A-register into partial data to be controlled in the control time t_1 and another partial datum consisting of the remainder thereof based on the outcome from the comparison, said B-register storing those partial data from said arithmetic circuits which have the control time t_1 as one datum, said other partial data being returned to the corresponding A-registers, respectively, said objects being controlled simultaneously by said one datum stored in said B-register.

4,050,002

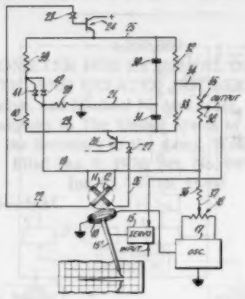
FEEDBACK SIGNAL GENERATOR FOR A SERVO CONTROL CIRCUIT

Howard N. Fawcett, Briarcliff Manor, N.Y., assignor to Cambridge Instrument Company, Inc., Ossing, N.Y.

Filed Sept. 23, 1975, Ser. No. 615,928
Int. Cl.[2] G05B *1/06*
U.S. Cl. 318—661 **5 Claims**

1. Means for generating a feedback signal for a servo motor having a rotatable shaft comprising a first coil, second and third coils angularly disposed one relative to the other and inductively coupled with the first coil, means for feeding an AC voltage to the first coil to induce AC voltages in the second and third coils, means coupled to said shaft and at least one coil for effecting relative movement about an axis between the first coil and the second and third coils, and means for combining the voltages of the second and third coils to produce a feedback voltage, said second and third coils each having an annular configuration and are positioned in intersecting relationship and said first coil is of annular configuration and greater in size than the second and third coils to permit rotation thereof about an axis relative to the second and third coils,

the axis defined by the intersections of the second and third coils being inclined relative to the axis of rotation and the plane



defined by said first coil is inclined relative to the axis of rotation and the axis of said second and third coils.

4,050,003

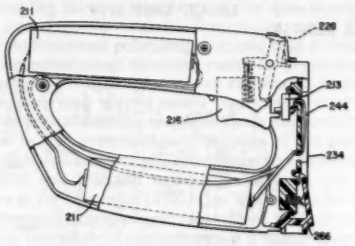
MODULAR CORDLESS TOOLS

Peter Russell Owings, Towson, Md.; Jacobus Jan Beckering, Brockville, Canada, and Roderick Francis Bunyea, Cockeysville, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Continuation of Ser. No. 500,131, Aug. 23, 1974, Pat. No. 3,952,239. This application Feb. 18, 1976, Ser. No. 659,035

Int. Cl.[2] H01R *13/54;* **H01M** *10/46;* **320** *2-5*

U.S. Cl. 320—2 **4 Claims**



1. A modular, cordless electric tool assembly comprising a power handle module having an enclosing casing, said casing forming a four-sided closed loop about a central opening, one of said sides being configured to provide a hand grip, a plurality of battery cells enclosed within said casing, switch means comprising an electric switch mounted within said casing and a switch operator extending externally of said casing within said closed loop for engagement and manipulation by an operator having his hand in place on said hand grip, a second side of said power handle being provided with a plurality of exposed electrical contacts, means internally of said casing connecting said contacts with said battery cells, a longitudinally extending pilot surface on said second side of said power handle; a tool head module including a housing, output means on said housing, one side of said housing having electrical contact means exposed thereon for interengagement with said electrical contacts on said power handle, a pilot region exposed in said one side of said tool head housing for engaging said pilot surface on said power handle; and complementary male and female interconnection means provided respectively on said second side of said power handle and on said one side of said tool-housing permitting sliding interengagement and disengagement of said power handle and said tool head, said tool head module being stably connected mechanically to said power handle module and electrically connected to said batteries when said power handle and said tool head are engaged.

4,050,004

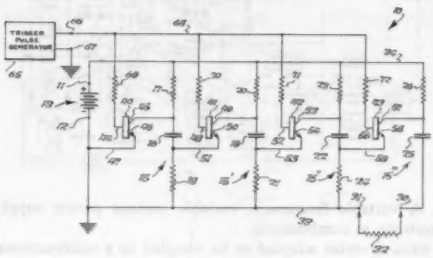
CARDIAC PACER INCLUDING CONTROLLED VOLTAGE MULTIPLIER

Wilson Greatbatch, Clarence, N.Y., assignor to Wilson Greatbatch Ltd., Clarence, N.Y.

Continuation-in-part of Ser. No. 32,942, April 29, 1970, Pat. No. 3,878,450. This application Jan. 2, 1974, Ser. No. 429,527

Int. Cl.[2] H02M *7/00*

U.S. Cl. 363—59 **12 Claims**



1. A cardiac pacer comprising:

a. a voltage source;

b. a controlled voltage multiplier having an input connected to said voltage source and an output;

c. pulse generating means connected in controlling relation to said voltage multiplier, said pulse generating means including timing means controlling the generation of pulses; and

d. a pair of output terminals connected to the output of said voltage multiplier, at least one of which is adapted to be operatively coupled to a patient's heart.

4,050,005

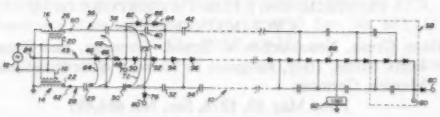
DUAL PHASE INPUT MULTIPLIER

Brian K. Maginness, Plano, Tex., assignor to Biometrics Instrument Corporation, Garland, Tex.

Filed May 27, 1976, Ser. No. 690,537

Int. Cl.[2] H02M *7/00*

U.S. Cl. 363—59 **33 Claims**



1. A voltage multiplier comprising:

a first AC line;

a second AC line;

a diode line having a plurality of series connected diodes interposed between said first and second AC lines;

a plurality of capacitors interconnected to said lines to define a plurality of multiplier stages;

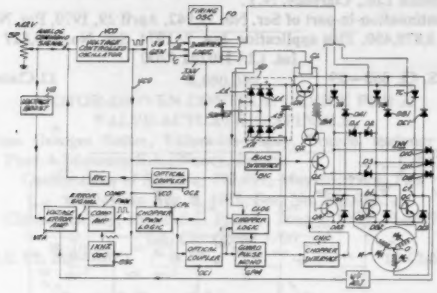
transformer input means connected to the input of said multiplier stages for receiving AC voltage for driving said plurality of multiplier stages; and

output voltage tapping means extending from one of said AC lines and from at least one point along said diode line and including a rectifier for providing an isolated multiplied DC output voltage.

4,050,006
INVERTER HAVING CONSTANT FREQUENCY CHOPPER SYNCHRONIZED TO MODULATION FREQUENCY

Frederick A. Stich, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 22, 1976, Ser. No. 744,133
Int. Cl.² H02M 7/00
U.S. Cl. 363—98 **10 Claims**



1. A variable frequency, variable voltage power supply comprising, in combination,

a static inverter adapted to be coupled to a unidirectional electric power source and including a plurality of load current carrying semiconductor switches,

semiconductor chopper means in one polarity of said source between said source and said semiconductor switches without a filter between said chopper means and said switches,

means for modulating said semiconductor switches at a selectively variable frequency to establish the output frequency of said inverter,

means including a carrier constant frequency oscillator for time ratio controlling said chopper means at the carrier frequency of said oscillator, said carrier constant frequency being independent of said inverter output frequency and sufficiently high to permit elimination of a filter between said chopper means and said semiconductor switches, and

means for synchronizing the switching of said chopper means to said inverter output frequency so that chopping is identical in the positive and negative half cycles of the inverter output waves.

4,050,007
CONTROL UNIT FOR THYRISTORS OF A CYCLOCONVERTER

Hans Gross, Neunkirchen a. Brand, Germany, and Eugenio Berti, Milan, Italy, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 10, 1976, Ser. No. 684,497
Int. Cl.² H02M 7/155
U.S. Cl. 363—87 **2 Claims**

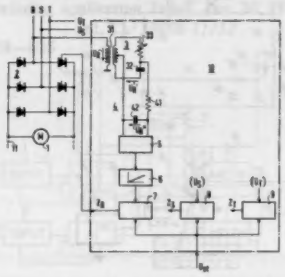
1. A control unit for thyristors of a cycloconverter, the thyristors being adapted to be connected to a three phase network generating three phase voltages, the control unit comprising:

means for deriving a measuring voltage from a phase voltage, said means for deriving comprising a transformer having a primary winding adapted to be responsive to a phase voltage and a secondary winding having a tap;

phase-shift means for phase-shifting said measuring voltage, said phase-shift means shifting the phase of said measuring voltage by a first amount which compensates for the phase shift of said measuring voltage relative to said phase voltage by a second amount, said second amount of phase shift being applied to said measuring voltage by passage of said measuring voltage through a smoothing means, said phase-shift means comprising:

said secondary of said transformer;

a series connection of a capacitor and potentiometer;

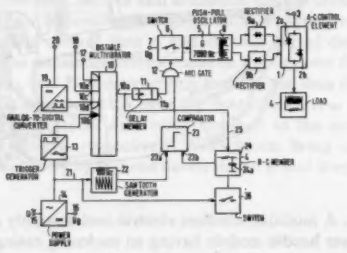


and smoothing means for smoothing said measuring voltage, said smoothing means being connected between said capacitor and said potentiometer, said smoothing means shifting the phase of said measuring voltage by said second amount.

4,050,008
CONTROL UNIT FOR AN A-C CONTROL ELEMENT WITH FULL-WAVE CONTROL

Helmut Glaser, Forchheim, and Ludwig Schick, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 8, 1976, Ser. No. 674,808
Claims priority, application Germany, Apr. 17, 1975, 2516934
Int. Cl.² G05F 1/44
U.S. Cl. 323—19 **2 Claims**



1. A control unit for use with an a-c supply voltage and for use with an a-c control element having full-wave control and including thyristors having firing electrodes, said control unit comprising:

a push-pull oscillator for generating firing pulses for said thyristors; and

control means for switching said oscillator on at the beginning of a first half-wave of said a-c supply voltage and for switching said oscillator off at the end of a second half-wave of said supply voltage, said second half-wave being opposite in sign to said first half-wave, said control means including:

a bistable multivibrator;

a delay line for delaying the signal generated by said multivibrator;

a sawtooth generator operating at twice the frequency of said a-c supply voltage;

an R-C circuit responsive to the output signal of said multivibrator;

a comparator circuit responsive to the output signals of said sawtooth generator and said R-C circuit;

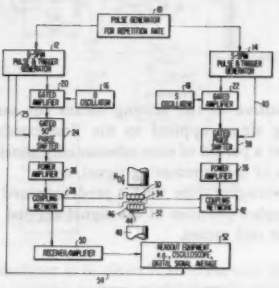
and a digital logic means including an AND logic circuit responsive to the output signals of said comparator and said delay line for generating an output signal for switching said oscillator on and off.

4,050,009

SPECTROMETER FOR EXTERNAL DETECTION OF MAGNETIC AND RELATED DOUBLE RESONANCE

Paul L. Sagalyn, and Michael N. Alexander, both of Lexington, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 9, 1976, Ser. No. 647,699
Int. Cl.[2] G01R *33/08*
U.S. Cl. 324—.5 AC **11 Claims**



1. In double resonance spectrometer apparatus including, a probe containing first abundant and second rare spin systems which are adapted to undergo gyromagnetic transitions due to dipolar coupling between abundant and rare spins at respective different gyromagnetic resonance frequencies, means for producing a unidirectional polarizing magnetic field through said probe in a predetermined direction, means for producing resonance transitions in both spin systems at different frequencies comprising first and second means respectively establishing first and second alternating magnetic fields substantially perpendicular to said predetermined direction of the polarizing magnetic field and substantially at the respective gyromagnetic frequency of said first and second spin systems, and means responsive to the resonance of said first spin system for detecting the resonance in said second spin system, the improvement comprising: first material containing said first spin system; and second but separate material containing said second spin system, wherein said first means establishing said first alternating magnetic field influences said first material and said second means establishing said second alternating magnetic field influences said second material and wherein said first and second means comprises coils respectively surrounding said first and second material.

4,050,010

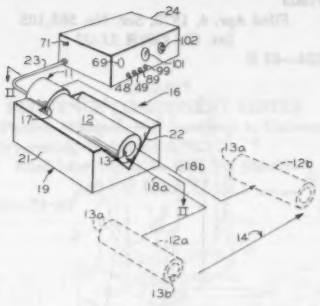
APPARATUS UTILIZING A TEST SURFACE WITH A MAGNETIC FLUX GAP FOR DETECTING DIMENSIONAL DISCONFORMITIES OF MANUFACTURED ELEMENTS

Theophile Isnard, Pont de Claix Isere, France, assignor to Caterpillar France S.A., Isere, France

Filed Feb. 24, 1976, Ser. No. 660,948
Claims priority, application France, Feb. 26, 1975, 75.06015
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—34 R **8 Claims**

1. Apparatus for determining if at least one dimension of each of a series of ferromagnetic elements differs from a predetermined desired value, comprising:

an electromagnetic sensing device having a ferromagnetic core forming a magnetic flux path, said core having an exteriorly exposed test surface against which successive ones of said elements may be disposed in a predetermined position relative thereto, said core having a gap in said flux path at said test surface with said gap being located in said test surface to be spanned by disconforming ones of said elements which differ along said dimension from other conforming ones of said elements that conform to said desired value, said gap being further located in said test surface to remain unspanned by said conforming ones of said elements thereby causing said core to exhibit a substantially lower reluctance when a disconforming one of said elements is positioned against said test surface as compared with when a conforming one is positioned



thereagainst, said sensing device further having an electrical winding magnetically coupled to said core to establish said magnetic flux therein,

a power supply for electrically energizing said winding,

circuit means for detecting a predetermind degree of change of the self-inductance value of said winding whereby said disconforming ones of said elements may be distinguished from said conforming ones thereof, and

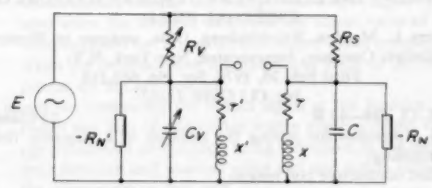
guide means for receiving each of said elements in sequence and for defining said predetermined position of said elements at said test surface of said sensing device.

4,050,011

EDDY CURRENT FLAW DETECTOR USING A PAIR OF PARALLEL RESONANT CIRCUITS AND A NEGATIVE RESISTANCE IN PARALLEL WITH EACH CIRCUIT

Toshihiro Mori, Yokohama, and Seigo Ando, Kawasaki, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Japan

Continuation of Ser. No. 513,083, Oct. 8, 1974, abandoned, which is a continuation of Ser. No. 210,462, Dec. 21, 1971, abandoned. This application Nov. 14, 1975, Ser. No. 632,116
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—40 **5 Claims**



1. An eddy current flaw detecting apparatus,

a bridge circuit in which a pair of adjacent arms thereof each include a coil, a condenser and a negative resistance device connected in parallel with each other and forming a resonant circuit,

one terminal of said bridge arms being connected in common to one terminal of an energization source,

a pair of resistance device connected in common at one end to the other terminal of the source,

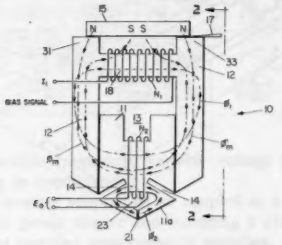
the other terminal of each resistance device being connected to the other terminal of a respective bridge arm and to a respective output terminal.

4,050,012

DUAL BIASED STATIC SENSING MAGNETIC TRANSDUCER

James D. Flora, 7067-1/2 Vineland Ave., North Hollywood, Calif. 91605

Filed Apr. 4, 1975, Ser. No. 565,105
Int. Cl.² G01R *33/02*
U.S. Cl. 324—43 R **5 Claims**



1. A magnetic transducer for sensing and indicating the presence of an external magnetic field, the transducer comprising, in combination:

a core formed from magnetic permeable material,

a magnetic flux-conducting ring-shaped field sensor having a gap at one side, connected to the core at a point opposite said gap, said core and field sensor being magnetically isolated from one another, except at the point of contact, by high reluctance slots

first flux inducing means for establishing a unidirectional magnetic flux within the core to bias said core for operation on a minor hysteresis loop of the core material,

second flux inducing means for establishing an alternating magnetic flux within the core, said high reluctance slots diverting the unidirectional and alternating flux away from said gap, and

an output coil wound around the core in which a composite output signal is induced in response to the unidirectional and alternating flux and the magnetic flux of the external magnetic field sensed by said ring sensor.

4,050,013

MAGNETIC FIELD PROBE WHICH MEASURES SWITCHING CURRENT OF MAGNETIC ELEMENT AT MOMENT THE ELEMENT SWITCHES AS MEASURE OF EXTERNAL FIELD

Harry L. Maddox, Reynoldsburg, Ohio, assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,218
Int. Cl.² G01R *33/02*
U.S. Cl. 324—43 R **12 Claims**

5. Apparatus for testing the strength of a magnetic field comprising:

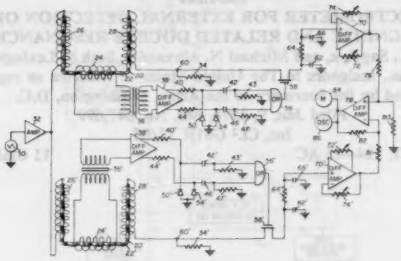
first conductive coil means;

a magnetic material element having substantially a square hysteresis loop and located within the magnetic influence of the first conductive coil and the magnetic field under test;

second conductive coil means located within the magnetic influence of the magnetic material element;

means for applying an alternating signal to the first conductive coil means, said signal being of sufficient intensity to switch the magnetic material element;

means for sensing a voltage generated in the second conductive coil means at the instant at which the magnetic material element switches magnetic state;



means responsive to the sensing means for sampling the alternating signal applied to the first conductive coil means over a period of time substantially shorter than the cycle time of said alternating signal; and

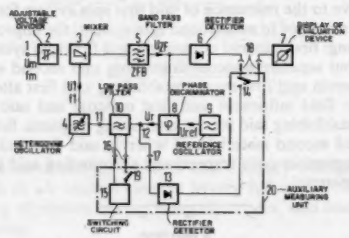
means for averaging over time a predetermined succession of the sampled portions of the signal applied to the first conductive coil means.

4,050,014

CIRCUIT ARRANGEMENT FOR MEASURING THE PHASE MODULATION DISTURBANCE OF A TEST SIGNAL

Helmuth Fink, Munich, and Güenter Wess, Oberalting-Seefeld, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 10, 1976, Ser. No. 665,500
Claims priority, application Germany, Mar. 14, 1975, 2511323
Int. Cl.² G01R *27/00*
U.S. Cl. 324—57 H **10 Claims**



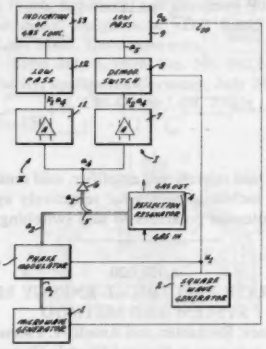
1. A circuit for detecting phase modulation disturbances of a signal, which has passed through a test object, in the carrier-frequency band comprising a carrier-frequency selective heterodyne receiver comprising a mixer receiving the incoming signal after it has passed through said test object, a band pass filter receiving the output of said mixer and passing an I.F. frequency, a voltage tunable heterodyne oscillator supplying an input to said mixer, a reference oscillator, a phase discriminator receiving a portion of said I.F. frequency and the output of said reference oscillator and producing an output voltage which is supplied to said voltage tunable heterodyne oscillator to adjust the frequency of said heterodyne oscillator, a first detector receiving a portion of the I.F. output of said band pass filter, and an evaluation device receiving the output of said first detector.

4,050,015

CONTROL OF MICROWAVE GENERATOR-CAVITY RESONATOR COMBINATIONS FOR GAS ANALYZER

Wolf-Dieter Zollner, Aachen, Germany, assignor to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 6, 1976, Ser. No. 702,844
Claims priority, application Germany, July 4, 1975, 2529829
Int. Cl.[2] G01R 27/04
U.S. Cl. 324—58.5 C 9 Claims



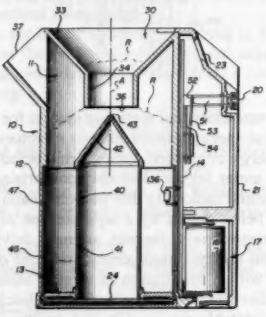
8. In an analyzer as in claim 7, wherein said spectrum generating means includes a phase modulator, the resonator being of the reflector variety.

4,050,016

VOLUMETRIC MOISTURE TESTER

Norman F. Marsh, Auburn, and Warren H. Kelly, Springfield, both of Ill., assignors to Dickey-john Corporation, Auburn, Ill.

Filed Apr. 2, 1976, Ser. No. 673,195
Int. Cl.[2] G01R 27/26
U.S. Cl. 324—61 R 6 Claims



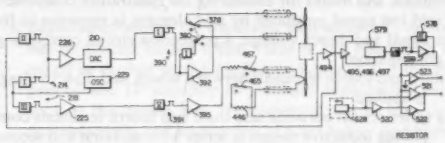
1. A moisture tester for grain and the like comprising a walled test chamber including an inclined pour spout and an inclined conical distributor funnel affixed upon and extending into the chamber of the chamber top, and spaced apart electrodes forming an electrical capacitor at the chamber bottom, the electrodes being located so that the dielectric constant of the capacitor is modified in accordance with the dielectric constant of the test material sample due to moisture therein, an electrical circuit including the capacitor for generating a signal which varies systematically in accordance with the capacitor dielectric constant, the funnel distributor extending into the test chamber interior but spaced apart from the test chamber walls for uniformly distributing the material which comprises the sample introduced into the test chamber and thereby minimizing corresponding variations in the sensed test material dielectric constant the pour spout being defined in part by an inclined wall extending from the chamber at a point above the electrodes and below the funnel in a direction substantially parallel to the distributor funnel to encourage a rapid, uncongested pour-out of test sample material when the test has been completed, and conical means having a tip aligned with the funnel means axis to encourage uniform deflection, flow and packing of test material into the test chamber.

4,050,017

SEQUENCE COMPONENT TESTER

Eldred H. Paufve, Windsor, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,656
Int. Cl.[2] G01R 15/12
U.S. Cl. 324—73 AT 27 Claims



1. An electrical component sequence tester for a plurality of components of nominal values presented in a predetermined sequence comprising:

a pair of contacts for electrically engaging in sequence a component therebetween;

means for forming a two legged bridge using said component between said pair of contacts as a first leg in series with a selected resistance chosen out of a limited plurality of resistors as a second leg;

means for generating a fixed voltage reference signal and a variable voltage test signal, said means for generating a fixed voltage reference signal including a fixed voltage source inputted to a fixed gain amplifier device; and said means for generating a variable voltage test signal including said fixed voltage source inputted to a variable gain amplifier device, said reference signal being the output of said fixed gain amplifier device, and said test signal being the output of said variable gain amplifier device;

means for selectively applying said reference signal and said test signal each to an opposite end on said bridge;

means for feeding back the output signal at the junction between said legs of said bridge to said generating means to electrically balance said bridge, said output signal being zero when the nominal value and the actual value of the component on test are equal, said output signal being finite when the nominal value and the actual value of the component on test are unequal;

means for comparing the output signal at the junction between said legs of said bridge with a predetermined voltage value, said comparison being indicative of the difference between said nominal value and said actual value of the component on test; and

means for controlling said forming means, said generating means, said applying means and said comparing means as a function of the type of test to be performed, the nominal value of the electrical component and an acceptable value of deviation between said nominal value and said actual value.

4,050,018

CAPACITANCE METER BIAS PROTECTION CIRCUIT

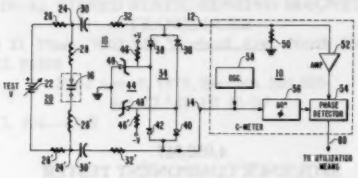
Alvin Malcolm Goodman, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,075

Claims priority, application United Kingdom, Sept. 24, 1975, 39152/75

Int. Cl.[2] G01R *1/36, 27/26*

U.S. Cl. 324—110 **7 Claims**



1. In a circuit for measuring the capacitance between first and second terminals between which an element to be tested is placed and which includes means for producing a test signal at a given frequency to be applied between said terminals, means for producing a direct voltage to be applied between said terminals, and means for measuring the quadrature component of said test signal produced by said element in response to the test signal and direct voltage, a protection circuit comprising, in combination:

third and fourth terminals between which said direct voltage is applied;

a series circuit between said third and fourth terminals comprising inductive means in series with said first and second terminals;

fifth and sixth terminals between which said test signal is applied;

a circuit resonant at said test signal frequency connected between said first and sixth terminals including, in series between said third and fifth terminals a direct voltage blocking capacitance and resistance means, said resonant circuit including also said inductive means, and

semiconductor switching means normally exhibiting a relatively high impedance connected between said fifth and sixth terminals and responsive to a short circuit appearing between said first and second terminals for exhibiting a relatively low impedance to permit discharge of said direct voltage blocking capacitance.

4,050,019

RANGE SWITCHING CIRCUIT FOR SOLID STATE ELECTROMETER

Joseph C. Nirschl, West Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 26, 1976, Ser. No. 708,665

Int. Cl.[2] G01R *15/08, 1/30*

U.S. Cl. 324—115 **5 Claims**

1. An electrometer which comprises: an operational amplifier having an input connected to the source of the current to be measured, and an output;

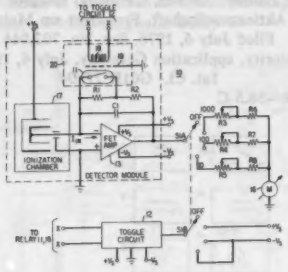
means for applying a feedback signal from the output of said operational amplifier to the input to control the gain thereof, said feedback applying means including at least first and second feedback resistors serially connected in a feedback loop between said output and input;

means connected to the output of said operational amplifier for indicating the amplitude of the output signal therefrom;

means for supplying first and second potentials of opposite polarities;

means for altering the sensitivity of said indicating means thereby to provide a plurality of measurement ranges for said electrometer; and

polarity sensitive switching means activated by the operation of said sensitivity altering means to selectively short out at least one of said first and second resistors to change



the gain of said operational amplifier, said sensitivity altering means including means for selectively applying said opposite potential polarities to said switching means.

4,050,020

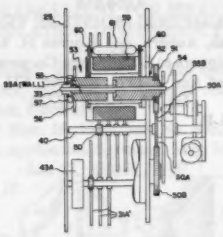
MULTIPLE RATE ELECTRICAL ENERGY METERING SYSTEM AND METHOD

Warren R. Germer, Rochester, and Ansell W. Palmer, Hampton, both of N.H., assignors to General Electric Company, Somersworth, N.H.

Filed Sept. 17, 1976, Ser. No. 724,041

Int. Cl.[2] G01R *15/08*

U.S. Cl. 324—116 **10 Claims**



1. A multiple rate electrical metering system for registering the total electrical energy consumed by a monitored load and the electrical energy consumed during preselected time intervals including a meter register assembly comprising three sets of rotatably mounted indicating dial pointers, each of said sets of dial pointers being driven by a separate one of three gear trains coupled, respectively, thereto, an input drive gear coupled in continuous meshing engagement with one of said three gear trains and with a first clutch idler gear assembly and a second clutch idler gear assembly, said first clutch idler gear assembly being rotatably mounted in juxtaposition with a first clutch and brake assembly that is mounted for movement relative thereto, a second clutch and brake assembly mounted adjacent said second clutch idler gear assembly for movement relative thereto, said first clutch and brake assembly including a first clutch gear rotatably mounted in continuous meshing engagement with a gear in the second of said three sets of gear trains, said second clutch and brake assembly including a second clutch gear rotatably mounted in continuous meshing engagement with a gear in said third set of gear trains, said first clutch and brake assembly being operable to move from a braked position against a brake member that prevents the gears of said second gear train from rotating to an engaged position that holds it against the first clutch idler gear assembly for rotation therewith, said second clutch and brake assembly being operable to move from a braked position that prevents the gears of said third gear train from rotating to an engaged

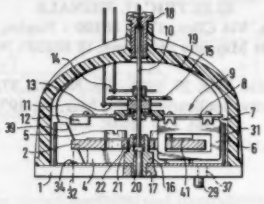
position that holds it against the second clutch idler gear assembly for rotation therewith, and means for selectively operating said first and second clutch and brake assemblies to move them, respectively, into either their braked or engaged positions.

4,050,021

MOVING-COIL MEASURING SYSTEM WITH A LARGE POINTER DEFLECTION

Hans-Georg Flach, Kronberg, and Bernhard Stier, Schwalbach, both of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed July 6, 1976, Ser. No. 702,457
Claims priority, application Germany, July 24, 1975, 2533057
Int. Cl.² G01R 5/08, 1/02
U.S. Cl. 324—150 **8 Claims**



1. In a moving-coil measuring system with large pointer deflection, comprising:

A. a pole plate,

B. a pole ring including a projection,

C. a permanent magnet arranged between the pole plate and the projection,

D. a first bushing mounted in the pole plate,

E. a second bushing in a support fastened to the pole plate, the first and second bushings being concentric with respect to the pole ring, and

F. a moving coil embracing the pole ring and mounted on a shaft, said shaft rotating in the first and second bushings, the moving coil being adapted to move a pointer,

the improvement comprising:

G. means for fastening the first bushing to the pole ring at a point on the pole ring which is fixed adjacent to the first bushing and which integrally forms a central part of the pole ring.

4,050,022

AM-FM RECEIVER HAVING IMPROVED MODE CONVERSION

Robert J. McFadyen, Syracuse, and William Peil, N. Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

This application Oct. 12, 1976, Ser. No. 731,281
Continuation of Ser. No. 623,653, Oct. 20, 1975.
Int. Cl.² H04B 1/06
U.S. Cl. 325—315 **20 Claims**

1. In a radio receiver having AM and FM modes, the combination comprising:

A. a d.c. coupled IF amplifier for signals at two intermediate frequencies, subject to amplification control by bias voltage variation and including a plurality of stages having wide band a.c. gain embracing both of said frequencies, each stage including an emitter coupled transistor pair,

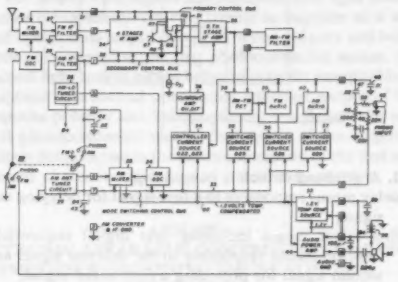
b. means comprising a primary control bus for applying a d.c. collector bias to the individual IF amplifier transistors, said potential being subject to variation in accordance with the mode setting of the radio receiver and/or a signal parameter,

c. a secondary control bus for controlling the input bias level of the individual IF amplifier transistors and for applying a degenerative feedback to balance each transistor pair,

d. means for establishing said secondary control bus at a potential which is a function of the potential of said primary control bus and for applying degenerative d. c. feedback to said secondary control bus, including

1. a collector load resistance connected between said primary control bus and the collector of the final transistor of one IF amplifier stage, and

2. a degenerative feedback resistance having one end connected to said collector and the other end to the base of said final transistor and to said secondary control bus, and



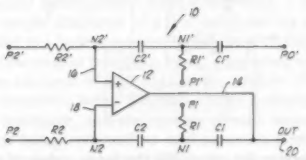
e. capacitance means for bypassing said secondary control bus to ground having a first value in the FM mode, selected in respect to the feedback resistance and the FM gain of said IF amplifier to preclude degenerative feedback at the higher FM IF frequency and to provide a decreased gain and attenuation of noise below said higher IF frequency, and a second value in the AM mode selected in respect to said feedback resistance and the AM gain of said IF amplifier to preclude degenerative feedback at the lower AM IF frequency.

4,050,023

GENERAL PURPOSE POLE-ZERO SINGLE AMPLIFIER ACTIVE FILTER

Albert D. Edgar, 3217 Rock Hollow Road, Oklahoma City, Okla. 73120

Filed Mar. 30, 1976, Ser. No. 672,038
Int. Cl.² H03B 1/00
U.S. Cl. 328—127 **11 Claims**



1. An active resistance-capacitance filter circuit comprising:

input and ground terminals; an operational amplifier having an output and positive and negative inputs; and

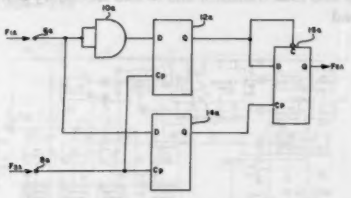
first and second resistance-capacitance networks each connected to the respective positive and negative inputs of the operational amplifier and each consisting of plural series-connected capacitors and interstitially parallel-connected resistors wherein the extremity terminals of each resistor and finally connected capacitor constitute a port, and wherein selected ports are selectively connectable to input and ground terminals and the operational amplifier output to provide a desired linear transfer function at the output of said operational amplifier.

4,050,024

SIDEBAND DETECTOR

Fendall Gregory Winston, IV, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 2, 1975, Ser. No. 618,872
Int. Cl.[2] H03B 3/04
U.S. Cl. 328—134 3 Claims



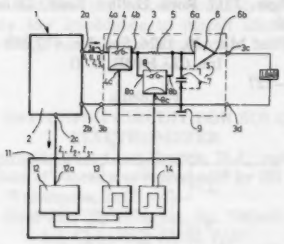
1. A sideband detector, comprising:
delay means responsive to a first signal for delaying said first signal;
first mixer means including first digital sequential logic flip-flop means responsive to the delayed signal and to a second signal for providing a first mixed signal;
second mixer means including second digital sequential logic flip-flop means responsive to both said first and said second signals for providing a second mixed signal; and
digital detector means defining a sequential logic flip-flop responsive to both said first and said second mixed signals for detecting one sideband of the mixed signals.

4,050,025

APPARATUS FOR OBTAINING A MEAN VOLTAGE VALUE

Bernhard Gerber, Langenthal, Switzerland, assignor to Greiner Electronic AG

Filed July 27, 1976, Ser. No. 709,240
Claims priority, application Switzerland, Sept. 1, 1975, 11280/75
Int. Cl.[2] G06G 7/24
U.S. Cl. 328—143 3 Claims



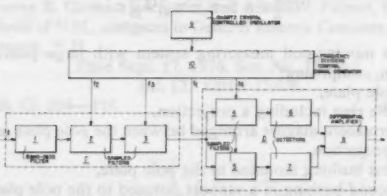
1. Apparatus for obtaining the mean value of a number of measuring voltage values, comprising
a. measuring-transmitting means (2) for producing a series of measurement voltages (U_1, U_2, U_3, . . .) and a series of counting pulses (Z_1, Z_2, Z_3, . . .) corresponding with said measurement voltages, respectively;
b. mean-value producing means (3) having at least one input terminal (3a) connected with measuring-transmitting means for receiving said series of measurement voltages, and at least one output terminal (3c) adapted for connection with load, said mean-value producing means including a series branch connected between said input and output terminals including, in series,
1. first switch means (4) operable between normally open and closed conditions, respectively; and
2. a resistor-capacitor network including a resistor (5) connected between said first switch means and said output terminal, and a capacitor (7) connected in parallel with the load; and
c. program-control means (11) having an input terminal connected with said measuring-transmitting means for receiving said counting pulses, said program-control means being operable upon the receipt of said counting pulses to close said first switch means for selected periods of time T_i which fulfill the condition $T_i = RC\ln(i/(i-1))$, where i is the number of the voltage value, R is the resistance value of said resistor when the i-th voltage value is supplied, and C is the capacitance of said capacitor, whereby the output voltage at said output terminal is the average of the series of measurement input voltages.

4,050,026

DEVICE FOR FREQUENCY DISCRIMINATION OF ELECTRICAL SIGNALS

Raffaele Cerra, Via Cilea, 171 - 80100 - Naples, and Michele Scherillo, Via Massimo Stanzione, 18 80100 - Naples, both of Italy

Filed Mar. 29, 1976, Ser. No. 671,373
Claims priority, application Italy, Mar. 28, 1975, 48845/75
Int. Cl.[2] H03K 9/06
U.S. Cl. 328—167 5 Claims



1. A device for filtering and frequency discriminating an electric signal, the device comprising:
a filter section including a band-pass filter, a first sampled resonant filter circuit and a second sampled resonant filter circuit connected in series, each of said first resonant filter circuit and said second resonant filter circuit having respective sampling control input means;
a discriminator including a third sampled resonant filter circuit and a fourth sampled resonant filter circuit coupled in parallel to said second filter circuit and responsive to its output, each of said third resonant filter circuit and said fourth resonant filter circuit having respective sampling control input means, a first detecting means coupled to said third resonant filter circuit and responsive to its output, a second detecting means coupled to said fourth resonant filter circuit and responsive to its output, and an output differentiated amplifier coupled to said third and fourth resonant filter circuits and responsive to outputs therefrom for producing an output signal representative of the frequency of a signal received by said band pass filter; and
means for producing and supplying respective sampling control signals of respective frequencies to each of said sampling control input means, said means for producing and supplying including a single high-stability oscillator feeding sampling control signal generating means.

4,050,027

OPTICAL SIGNAL AMPLIFIER

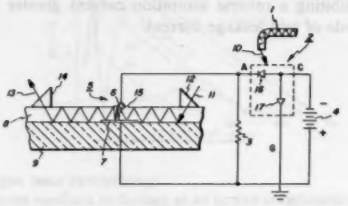
Gustav R. Pfister, Webster, and James C. Maher, Sodus, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1976, Ser. No. 710,484
Int. Cl.[2] H03F 3/04
U.S. Cl. 330—5 1 Claim

1. An apparatus for amplifying a modulated light signal

propagating through a first optical waveguide, which comprises:

a set of electrodes, the members of said set of electrodes being arranged to contact opposite sides of an elastomeric optical waveguide having unmodulated light of high intensity propagating therethrough such that a light-modulating deformation of said elastomeric optical waveguide occurs whenever a field of sufficient strength is established between said members, said set being electrically connected to a circuit such that said one member of said set of electrodes is electrically connected to the positive terminal of a D.C. power source and the opposing member of said set of electrodes is connected through a photodiode adapted for registering said signal to the negative side of said D.C. power source a resistor being placed



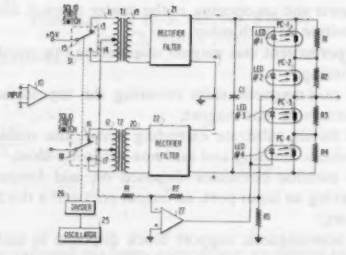
across the circuit between said photodiode and the positive terminal of said D.C. power source, said resistor having a resistance of not more than about 1/10 the dark resistance of the photodiode, and the photodiode having a light resistance of not more than about 1/10 the resistance of the resistor, the frequency response of the apparatus being not greater than $1/2\omega_{max}$ where ω max equals 2π **times the maximum modulation frequency, whereby the resistance of the photodiode when struck by modulated light from the first optical waveguide is sufficiently reduced to result in a field between said electrodes and a corresponding light-modulating deformation of the elastomeric optical waveguide such that the high intensity light output from the elastomeric optical waveguide is modulated corresponding to the modulation of said signal.**

4,050,028

HIGH VOLTAGE AMPLIFIER

Robert E. Vosteen, 1128 Archbald Road, Waterport, N.Y. 14571

Filed Dec. 10, 1976, Ser. No. 749,226
Int. Cl.² H03F *3/38*
U.S. Cl. 330—10 **10 Claims**



1. A high voltage operational amplifier system comprising:

a first operational amplifier,

first and second inverter means operable in opposite senses of polarity and having their respective inputs connected to the output of the first operational amplifier to convert the DC output voltage of the first operational amplifier to first and second stepped-up differential AC voltages at the same predetermined synchronized frequency,

first and second converter means to convert the first and second AC voltages to corresponding first and second DC voltages,

first and second photoconductor means connected in series across the outputs of the first and second converter means,

a second operational amplifier connected to function as an inverting amplifier having its (−) input connected to the output of the first operational amplifier through resistive means, and its (+) positive input connected to circuit common,

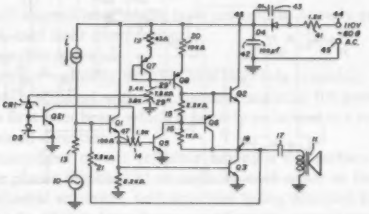
first and second light source means connected to the output of the second operational amplifier, the first light source means being selectively energizable in response to a second operational amplifier output of one polarity and being optically coupled to the first photoconductor means, the second light source means being selectively energizable in response to a second operational amplifier output of the opposite polarity and being optically coupled to the second photoconductor means, the output of the amplifier system being between the series connection of the first and second photoconductor means and circuit common.

4,050,029

ELECTRONIC APPARATUS COMPRISING AN AUDIO AMPLIFIER PROVIDING SHUNT VOLTAGE REGULATION

Robert J. McFadyen, Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed July 2, 1976, Ser. No. 702,287
Int. Cl.² H03F *3/04*
U.S. Cl. 330—22 **6 Claims**



1. Electronic apparatus comprising:

A. a source of bias voltage having two output terminals, one common, said source having appreciable internal resistance and requiring voltage regulation,

B. a push-pull audio output stage comprising: a first and a second output transistor of a first conductivity type, each connected in a base input configuration with the collector of said first output transistor being connected to the non-common terminal of said source, the emitter of said first output transistor being coupled to the collector of said second transistor, and the emitter of said second output transistor being returned to said common terminal, said output transistors having sufficient current capacity for shunt regulation of said source, the audio output of said output transistors being taken at their interconnection,

C. a driver stage for said push-pull output stage, comprising:

1. a third transistor of said first conductivity type for driving both output transistors, connected in base input, emitter-follower configuration, the emitter of said third transistor being d.c. coupled to the base of said second output transistor,

2. a phase inverting intermediate driver for coupling the output from the emitter of said third transistor to the base of said first output transistor and comprising a fourth transistor,

a. said fourth transistor being of said first conductivity type and having its base d.c. coupled to the emitter of said third transistor through a first resistance and the emitter common to parallel the input junctions of said

fourth and second transitors to stabilize their current ratio, and

D. output voltage regulating means coupled between said source output terminals comprising:

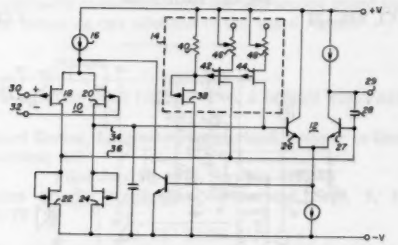
1. a voltage reference for sensing a deviation in bias voltage from a desired value,
2. means for producing an error current in response to said deviation, and
3. means for applying said error current to said first resistance to cause a change in base-emitter voltage in said second output transistor in response to said bias voltage, said change in base-emitter voltage altering said current ratio and changing the idling current of said second output transistor; and by virtue of said interconnection to the emitter of said first output transistor causing a corresponding change in idling current in said first output transistor, said idling current changes in said output transistors being in a sense to provide shunt regulation of said bias voltage.

4,050,030

OFFSET ADJUSTMENT CIRCUIT

Ronald W. Russell, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 549,196, Feb. 12, 1975, abandoned.
This application June 25, 1976, Ser. No. 699,776
Int. Cl.² H03F *3/16, 3/45*
U.S. Cl. 330—23 **5 Claims**



1. In combination with a differential amplifier including an input stage and a second stage connected together by a pair of output lines having an offset error voltage, an offset voltage adjusting circuit, comprising:

a. a current source;

b. first means connected in series with said current source for developing a voltage drop thereacross: and

c. a pair of transistors, each having their biasing circuits connected in parallel with said first means and having their outputs connected to respective ones of said output lines between said input stage and said second stage of said differential amplifier.

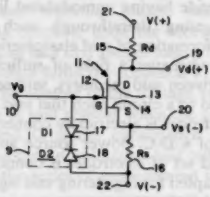
4,050,031

CIRCUIT AND STRUCTURE HAVING HIGH INPUT IMPEDANCE AND DC RETURN

Paul R. Gray, Orinda, and Mark L. Stephens, Campbell, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Mar. 1, 1976, Ser. No. 662,462
Int. Cl.² H03F *3/10, 3/16*
U.S. Cl. 330—24 **13 Claims**

1. A high impedance amplifier circuit comprising, an amplifier for receiving an input signal, said amplifier exhibiting a leakage current conducting in one direction, a leakage current conduction path connected to said amplifier for continuously biasing said amplifier and continuously providing a return for said leakage current irrespective of said input signal polarity and magnitude, said conduction path including first and second diode structures connected in series in opposite conduction directions said structure being operative independent of external fields and biasing means, one of said diode structure having a forward conduction direction opposite to said one direction



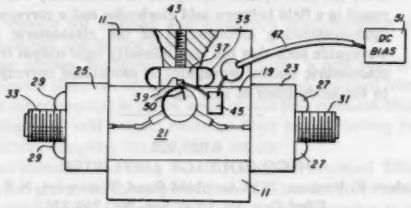
and exhibiting a reverse saturation current greater than the magnitude of said leakage current.

4,050,032

AVALANCHE DIODE AMPLIFIER

Hua Quen Tserng, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 2, 1976, Ser. No. 646,314
Int. Cl.² H03F *3/10*
U.S. Cl. 330—34 **1 Claim**



1. A microwave amplifier comprising:

a. a housing of non-magnetic metallic material having a recess and an opening at the center thereof, and in juxtaposition to each other,

b. a permanent bias magnet disposed in the opening of said housing,

c. a non-magnetic shim covering the top surface of said permanent bias magnet,

d. a ferrite substrate extending across the surface of said metallic housing and said non-magnetic shim,

e. a metallic circulator disposed on said ferrite substrate having an input port, an output port and a third electrical port,

f. a non-magnetic support block disposed in said recess of said housing and located adjacent to said third electrical port of said metallic circulator,

g. a diode mounted on said non-magnetic support block,

h. a bonding wire extending between said diode and said third electrical port of said metallic circulator and connected therebetween,

i. a pair of connector housings attached to said metallic housing, and

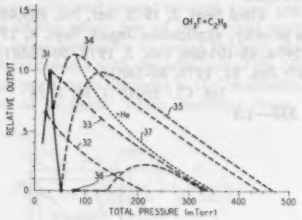
j. means bonding said pair of connector housings to the input and output ports of said metallic circulator.

4,050,033

SUBMILLIMETER WAVE AND FAR INFRARED MOLECULAR LASERS AND POLYATOMIC BUFFER GASES THEREFOR

Tso-Yuan Chang, Lincroft, and Chinlon Lin, Matawan, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 12, 1975, Ser. No. 631,225
Int. Cl.[2] H01S *3/00*
U.S. Cl. 331—94.5 G 6 Claims



1. A gas laser comprising

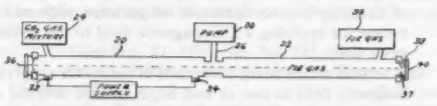
a gaseous medium including as an active constituent a molecular gas having a vibrational-rotational transition and an electric dipole moment, in which gaseous medium the vibrational relaxation time of the active gas is greater than its rotational relaxation time for the vibrational and rotational states involved in the lasing process, means for exciting said vibrational-rotational transition so as to selectively invert the population of a pure rotational transition within said gas, means for stimulating the emission of radiation from said rotational transition and for extracting a portion of said radiation for utilization, characterized in that said gaseous medium includes a hydrocarbon vapor for reducing the vibrational relaxation time of the active gas, whereby the vibrational relaxation time of the active gas is reduced by the transfer of vibrational energy from the active gas to said hydrocarbon vapor, the partial pressure of which hydrocarbon vapor is in an order of magnitude range centered about a unity ratio to the partial pressure of the active gas.

4,050,034

IN CAVITY PUMPING FOR INFRARED LASER

James D. Barry, Fairborn, and Joseph E. Brandelik, Clark County, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 30, 1975, Ser. No. 573,300
Int. Cl.[2] H01S *3/00*
U.S. Cl. 331—94.5 G 3 Claims



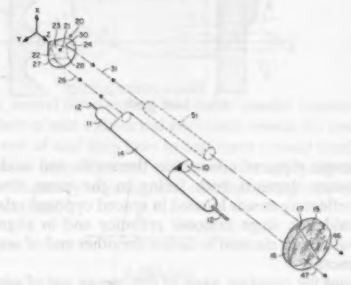
1. A far infrared gas laser, comprising: an optical laser cavity; means for containing lasing gas within said optical laser cavity; said means for containing lasing gas within said optical laser cavity including a first cell in a first portion of said optical laser cavity and a second cell, in another portion of said optical laser cavity, connected to said first cell; said first cell containing far infrared lasing gas molecules; means for providing a flow of CO_2 laser gas through said second cell; means for maintaining a separation of said far infrared gas molecules and said CO_2 gas; means for electrically exciting the CO_2 molecules to provide a population inversion in the CO_2 gas to produce intense circulating CO_2 laser radiation within said optical laser cavity; said CO_2 radiation being absorbed by the far infrared molecules to optically excite the far infrared molecules to produce a population inversion therein to provide a circulating far infrared radiation within said optical cavity; means for extracting far infrared laser energy from said cavity.

4,050,035

SELF-ALIGNED POLARIZED LASER

Ralph F. Wuerker, Palos Verdes Estates, and Lee O. Heflinger, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 13, 1976, Ser. No. 657,794
Int. Cl.[2] H01S *3/081*
U.S. Cl. 331—94.5 C 3 Claims



1. A self aligned laser of the type generating linearly polarized light, said laser comprising:

a. a laserable material;

b. means for optically exciting said laserable material;

c. means associated with said laserable material for generating a first laser beam which is linearly polarized in a predetermined direction;

d. a transparent corner reflector having a flat surface and three planes disposed at an angle to each other to form a tetrahedral structure, said structure being disposed in the path of said first laser beam, said first laser beam passing through said flat surface and then impinging on a first one of said planes of said corner reflector away from the apex thereof, said first laser beam being returned substantially parallel thereto to provide a second laser beam, said second laser beam being reflected on a plane adjacent said first plane and then from the third plane, whereupon said second laser beam issues from said flat surface; and

e. reflector means disposed in the path of said first and second laser beams for reflecting said laser beams, for defining an optical cavity and for permitting a portion of at least one of said laser beams to pass, said laserable material and said corner reflector being so aligned and adjusted with respect to each other that said second laser beam when reflected by said reflector means and said corner reflector will return through said laserable material with the same direction of polarization as said first laser beam generated by said laserable material.

4,050,036

OPTICAL SYSTEM FOR LASERS

William A. Chambers, North Tonawanda; Franklin B. Bossler, Williamsville, and Warren F. Brandkamp, Batavia, all of N.Y., assignors to Textron Inc., Providence, R.I.

Filed Feb. 25, 1976, Ser. No. 661,361
Int. Cl.[2] H01S *3/081*
U.S. Cl. 331—94.5 C 4 Claims

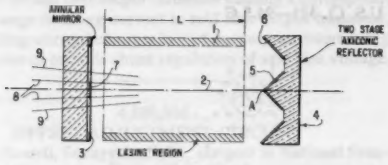
1. An improved laser construction comprising, in combination:

a cylindrical laser combustor for generating a phase coher-

ent optical field in the form of an annular cylinder which defines an axis;

unstable optical resonator means for producing an output beam from said field, which output beam is of low obscuration ratio;

said resonator means comprising an annular reflector centered on said axis and located adjacent one end of said field, said reflector having a reflecting surface facing toward the other end of said field and defining one end of the resonator means; a two stage axiconic reflector located beyond said other end of the field and optically aligned with said annular reflector, said axiconic reflector comprising an inner axiconic element and an outer axi-



conic element concentric therewith and said inner and outer elements both facing in the same direction; and reflecting means located in spaced opposed relationship to said two stage axiconic reflector and in alignment with said inner element to define the other end of said resonator means;

means for coupling some of the energy out of said resonator means;

the axis of said axiconic reflector being disposed at right angles to the axis of said field; and

an annular fold mirror disposed between said axiconic reflector and said reflecting means whereby optically to align said outer element with said annular reflector.

4,050,037

LASER BEAM ALIGNMENT

C. Harry Knowles, Moorestown; John R. Meckley, Mount Laurel, and Charles A. Naylor, Sewell, all of N.J., assignors to Metrologic Instruments, Inc., Bellmawr, N.J.

Filed June 10, 1976, Ser. No. 694,606

Int. Cl.[2] H01S 3/086

U.S. Cl. 331—94.5 D **8 Claims**

1. In a laser system having a laser tube rigidly mounted within a hollow, generally cylindrical housing, beam alignment apparatus comprising:

first means, rigidly attached to an end of said housing, having an opening for passage of the laser beam, and a plurality of other openings into said housing;

second means, movable within said housing, having an opening for passage of the laser beam, and threaded openings corresponding respectively to said other openings in said first means;

third means, adapted to receive optical apparatus generally in the path of the laser beam, said third means having threaded openings respectively associated with the threaded openings in said second means; and

a plurality of screws, each in rigid threaded engagement with respectively corresponding ones of said threaded openings in said second means and in said third means, said screws being smaller than and freely penetrating said other openings in said first means, wherein said second and third means are annular, and with said screws loosened are transversely movable together relatively to said first means and to the laser beam, and with said screws tightened, are adjusted at a fixed position relatively to said first means and to the laser beam.

4,050,038

EDGE-GUIDED MODE NON-RECIPROCAL CIRCUIT ELEMENT FOR MICROWAVE ENERGY

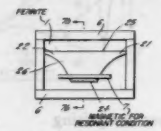
Tsutomu Noguchi; Yoshihiko Akaiwa, and Hidehiko Katoh, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

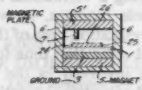
Filed Sept. 2, 1975, Ser. No. 609,489

Claims priority, application Japan, Sept. 4, 1974, 49-101665; Sept. 4, 1974, 49-101666; Feb. 3, 1975, 50-15681; Sept. 4, 1974, 49-101667; Jan. 31, 1975, 50-14816

Int. Cl.[2] H01P 1/36, 1/38

U.S. Cl. 333—1.1 **11 Claims**





1. A non-reciprocal circuit element for microwave energy comprising:

a ferrimagnetic slab;

a strip-line conductor formed on one main surface of the ferrimagnetic slab and having first and second spaced edge portions of different lengths aligned parallel to the direction in which microwave energy is chiefly propagated; said conductor having a generally trapezoidal shape in which the ends of said conductor taper from said first edge portion to said second edge portion; the ends of said second edge portion defining the end portions of said conductor;

a grounding conductor held in contact with the other main surface of the ferrimagnetic slab and kept at a ground potential;

a first means for applying a DC magnetic field to the ferrimagnetic slab in a direction perpendicular to the plane of said ferrimagnetic slab, wherein a non-reciprocal propagation characteristic is exhibited at opposing edge portions of the strip-line conductor, characterized in that a second means is provided for developing a non-uniform DC magnetic field distribution at least along one edge portion of the strip-line conductor in cooperation with said first means for applying a DC magnetic field to the ferrimagnetic slab;

said second means being comprised of means for supplying a magnetic field to one of said edges of said stripline conductor, the strength of the magnetic field being sufficient to cause said ferrimagnetic slab to bring about a magnetic resonance.

4,050,039

MAGNETIC TRIP ASSEMBLY

Gerald J. De Angelo, Ballwin, Mo., assignor to Zinsco Electrical Products, St. Louis, Mo.

Filed Jan. 2, 1976, Ser. No. 646,146

Int. Cl.[2] H01H 75/10, 77/06, 81/04

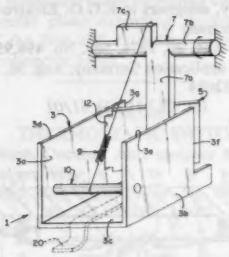
U.S. Cl. 335—38 **6 Claims**

1. A magnetic trip assembly for use with a latch mechanism

of a device to be controlled by the magnetic trip assembly, said magnetic trip assembly comprising:

a magnetic member having a first portion in a first plane, and a pair of opposed second portions at angles to the first portion and having pole faces in planes transverse to the plane of the first portion, said magnetic member being arranged to receive a load conductor adjacent to the first portion and operative to establish magnetic fields at said pole faces in response to the flow through the load conductor of a current having a value greater than a specified value;

an armature coupled to one of the second portions of the magnetic member and spaced through an air gap from the pole face of the other one of the second portions, said armature being operative to move through said air gap into physical contact with the pole face of the other one of the second portions in response to the establishment at the pole face of magnetic fields resulting from the flow



through the load conductor of a current having a value greater than the specified value;

an actuating and latch member adapted to be confined within a device to be controlled by the magnetic trip assembly and to engage a latch mechanism of said device, said actuating and latch member being coupled with the armature and operative to be moved by the armature in response to the aforesaid movement of the armature and to become disengaged from the latch mechanism of the device to be controlled;

a retaining member connected to the magnetic member; and

biasing means connected to the retaining member and to the actuating and latch member and operative following movement of the actuating and latch member and the armature to return the actuating and latch member and the armature coupled therewith to their positions prior to the aforesaid movement of the armature and the actuating and latch member.

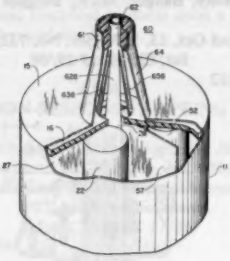
4,050,040

FAST-TUNED MULTIPLEXER-POWER COMBINER

George C. Fincke, West Allenhurst, and George W. Taylor, Brielle, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 12, 1976, Ser. No. 731,158
Int. Cl.[2] H01P *1/20, 7/04, 5/08, 7/06*
U.S. Cl. 333—73 C **17 Claims**

1. A device for filtering and combining two or more radio-frequency signals in a single coaxial output comprising an outer metallic cylindrical enclosure having a bottom plate and a top plate; at least two radial vanes joined along the central axis of said cylindrical enclosure, and dividing said cylindrical enclosure into at least two sections that comprise the outer conductors of at least two coaxial filter sections; an inner coaxial conductor centrally positioned in each of said coaxial filter sections; the lower end of each of said inner coaxial conductors being connected to said bottom plate of said cylindrical enclosure; an input connection for each of said coaxial filter sections extending through said outer cylindrical enclosure and connected to the upper end of each said inner coaxial conductors; means for tuning each of said coaxial filter sections separately; a strip line extending axially through each of said coaxial filter sections, said strip lines being equidistant from said central axis of said cylindrical enclosure; a coaxial output means having an outer coaxial conductor and an inner coaxial



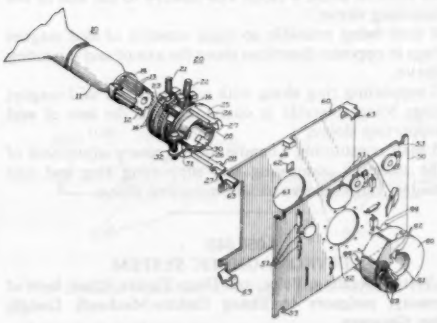
conductor; means for coupling said outer coaxial conductor to said top plate of said cylindrical enclosure; means for coupling the upper end of said strip lines to said inner coaxial conductor of said coaxial output means; and means for applying each of said radio-frequency signals to a corresponding one of said input connections.

4,050,041

STATIC/PURITY DEVICE FOR IN-LINE GUN

Konrad L. Schiecke, Mount Prospect, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 1, 1976, Ser. No. 672,693
Int. Cl.[2] H01J *29/82*
U.S. Cl. 335—210 **6 Claims**



1. In a color television receiver, a static/purity device for use on the neck of a color picture tube having a cluster of in-line electron guns located in said neck, and having a connecting base at the closed end of said neck making internal connections to said guns and forming a reference surface for the elements of said guns, said receiver including a printed circuit board having a foil side, and an electrical component carrying side, and a socket for making external electrical connections to said guns, mounted in fixed relationship to said board, said socket thereby being engageable with said base in fixed relationship with said reference surface, comprising: magnetic means producing corrective magnetic fields in the vicinity of said elements for compensating free fall beam landing errors in said tube, and a carrier for said magnetic means, having an integral pair of legs for positioning said carrier with respect to said board for assuring correct positioning of said purity device on said tube neck with respect to said reference

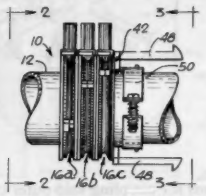
surface for aligning said magnetic means with said gun elements.

4,050,042

STATIC CONVERGENCE DEVICES FOR COLOR TELEVISION PICTURE TUBES

Albert M. Anthony, Bangor, Mich., assignor to Tracor, Inc., Austin, Tex.

Filed Oct. 13, 1976, Ser. No. 732,101
Int. Cl.² H01J *29/68*
U.S. Cl. 335—212 **17 Claims**



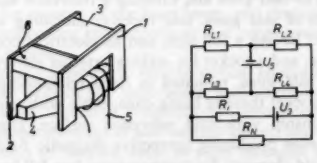
1. A convergence device for television picture tubes,
comprising a mounting sleeve having an axial opening for receiving the neck of a television picture tube,
at least one supporting ring rotatably mounted around said mounting sleeve for rotary adjustment relative thereto,
a pair of magnet rings rotatably mounted around said mounting sleeve and stacked upon said supporting ring,
said magnet rings having respective bevel gears formed in one piece with said magnet rings and facing toward each other,
a rotatable generally radial adjusting shaft having a bevel pinion meshing with and disposed between said bevel gears on said magnet rings,
and a member on said supporting ring supporting said shaft for rotation about a radial axis relative to the axis of the mounting sleeve,
said shaft being rotatable to cause rotation of said magnet rings in opposite directions about the axis of said mounting sleeve,
said supporting ring along with said shaft and said magnet rings being rotatable in common about the axis of said supporting sleeve,
said shaft constituting a handle for the rotary adjustment of the assembly comprising said supporting ring and said magnet rings relative to said mounting sleeve.

4,050,043

ELECTROMAGNETIC SYSTEM

Hans-Werner Reuting, Peine, and Hugo Eggers, Eltze, both of Germany, assignors to Elmeg Elektro-Mechanik GmbH, Peine, Germany

Filed Dec. 26, 1974, Ser. No. 536,436
Claims priority, application Germany, Dec. 29, 1973, 2365190
Int. Cl.² H01F *7/08*
U.S. Cl. 335—237 **14 Claims**



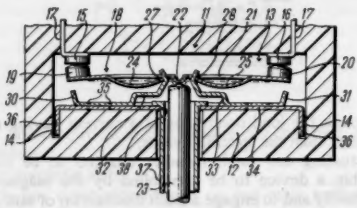
1. In an electromagnet system having a permanent magnet means for energization, further having a magnetically superimposing electromagnetic energization and a magnetizable output, all being included in a magnetic circuit, the improvement for preventing weakening of the permanent magnet means comprising:
a magnet shunt path for the permanent magnet means included in the circuit and connected in parallel thereto and having width dimensions so that the internal magnetic resistance of the shunt and of the permanent magnet means combined is smaller than the sum total of the magnetic resistance of the remainder of the magnetic circuit, the permanent magnet means having a particular demagnetization curve and the shunt having a particular magnetic load characteristics resulting in a point of intersection defined by a flux *Bo* and a magnetic field strength *Ho*, said permanent magnet means having a permeability μ so that $Bo + \mu Ho$ exceeds 8000 Gauss.

4,050,044

ELECTRICAL SWITCH

Karl Fischer, Oberderdingen, and Robert Kicherer, Knittlingen, both of Germany, assignors to E.G.O. Elektro-Geraete Blanc und Fischer, Germany

Filed Aug. 20, 1974, Ser. No. 498,950
Claims priority, application Germany, Aug. 30, 1973, 2343833; May 10, 1974, 2422684
Int. Cl.² H01H *61/01*
U.S. Cl. 337—137 **33 Claims**



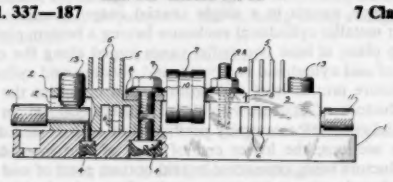
1. An electrical switch comprising a spring being made from resilient flat material and having a resilient base portion intermediate end portions, at least one contact carried on each portion, counter-contacts for engagement with respective contacts, spring tongues carried by said spring, the spring tongues being directed in opposite directions relative to one another, support bearings mounted in a fixed position with respect to said counter-contacts and adapted to support the ends of the spring tongues, the spring tongues being under stress and the ends of the tongues supported by the support bearings being directed towards one another, and an actuating member, moveable with respect to said support bearings, for engaging the resilient base portion of said spring and moving said contacts towards or away from said counter-contacts.

4,050,045

FINNED HEAT SINK FOR FUSE BLOCKS

Roger Henwood Motten, Jr., and Larry Paul LaFreniere, both of Bowling Green, Ohio, assignors to Marathon Electric Manufacturing Corporation, Wausau, Wis.

Filed Sept. 13, 1976, Ser. No. 723,028
Int. Cl.² H01H *85/02*
U.S. Cl. 337—187 **7 Claims**



1. A fuse holder of the pressure type construction for use

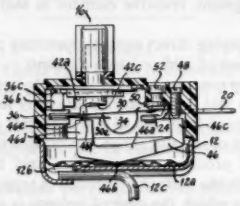
with fuses of varying amp capacity with heat being generated in the fuse holder in service which is required to be dissipated, which comprises a support, a pair of longitudinally spaced pressure connector blocks secured to said support, a generally small size fuse disposed in the space between the connector blocks and having tangs projecting from opposite ends and overlying the connector blocks, means extending through the tangs and into the connector blocks to secure the tangs to the connector blocks, at least one opening at the outer ends of the connector blocks disposed to receive electric wires to complete a circuit through the connectors and fuse, means securing the wires in place against the inside walls of the respective connectors, and at least one fin integrally formed with each connector block and projecting upwardly from each connector block at a location between a respective tang and the respective means securing a wire to a connector block to thereby dissipate heat from the metal area of each connector block between the fuse and the wire connections, said fin being approximately one-sixteenth of an inch in width and of a height to project to a horizontal plane extending vertically outwardly from a horizontal plane extending through the horizontal center line of the fuse and extending completely across the width of the connector block.

4,050,046

THERMOSTATIC SWITCH

Chester K. Wilson, Decatur, Ala., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed May 19, 1976, Ser. No. 687,892
Int. Cl.² H01H *37/40*
U.S. Cl. 337—319 **5 Claims**



1. In combination in a thermostatic control device:

a molded insulating base;

a pair of spaced apart electrical terminals secured on said base and extending outwardly thereof, one of said terminals having an electric contact mounted thereon within said base,

a one piece flexible metal member comprising a base portion, mounting portions extending perpendicularly of said base portion at opposite ends of the latter and then oppositely of said mounting portions being anchored near the ends thereof with one in electrical contact with the other of said terminals, a generally U-shaped portion having its legs connected to said base portion between said mounting portions and having an electrical contact mounted on its bight to align with said contact on said one of said terminals, an operator portion extending from said base portion partway towards said bight, an extension on said bight aligned with and extending towards the end of said operator portion, and flipper leg portions projecting from said base portion on opposite sides of said operator portion and having ends that hook back towards said base portions,

a spring member formed of flat spring metal and mounted between said operator portion and the hooked ends of said flipper legs so that it assumes generally a C-shape in longitudinal cross section to compressively load said operator portion and tensionally load said flipper legs so that said flexible metal member normally assumes a stable position in which its contact is disengaged from the first mentioned contact,

a thermal power element secured to said base and having a diaphragm which moves toward said operator portion of said flexible member in accordance with increases in pressure in its diaphragm chamber, and

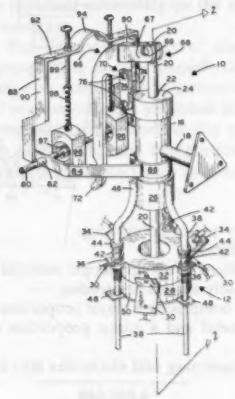
a one piece lever mounted for pivotal movement in said base and having a portion in engagement with said diaphragm and another portion engagable with said operator portion of said flexible member to move the latter and effect snap-action movement of said spring member to effect closure of said electrical contacts upon a given degree of movement by said diaphragm.

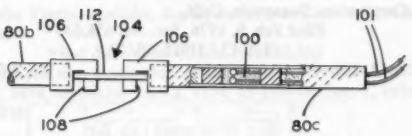
4,050,047

CONDITION-RESPONSIVE SPRING DRIVEN ACTUATOR

Marshall G. Pettit, 1489 Fruitdale Ave., San Jose, Calif. 95128

Filed Nov. 14, 1975, Ser. No. 631,884
The portion of the term of this patent subsequent to June 10, 1992, has been disclaimed.
Int. Cl.² F16K *17/36*
U.S. Cl. 337—408 **8 Claims**





1. A condition-responsive, spring driven actuator comprising:

A. an acutator housing;

B. an actuator shaft concentrically related to said housing and supported for rectilinear reciprocation;

C. a helical compression spring seated within the housing and connected with said shaft for continuously applying a force to said shaft for urging said shaft in axial displacement;

D. means for restraining said shaft against axial displacement including a fulcrum projected from said housing, a lever arm supported for pivotal motion by said fulcrum and having one end attached to said shaft, the other end thereof being depressible relative to said one end for causing said shaft to be displaced against the applied force of said spring, means for supporting said other end of the arm in a depressed configuration comprising a frangible bar for engaging the arm and securing it against pivotal motion, and means for supporting said bar at each of its opposite ends in a fixed relationship with said housing; and

E. means for separating said bar for releasing said lever arm for pivotal motion, whereby the shaft is released for axial displacement.

4,050,048

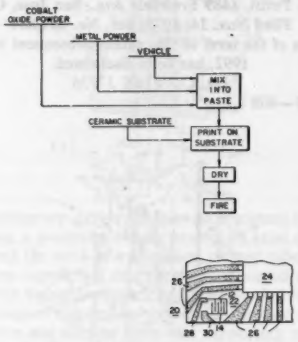
HUMIDITY SENSOR, MATERIAL THEREFOR AND METHOD

Lawrence E. Frazee, Norfolk, Nebr., assignor to Plessey Incorporated, Melville, N.Y.

Division of Ser. No. 566,350, April 9, 1975, Pat. No. 4,016,308. This application Dec. 2, 1976, Ser. No. 747,246

Int. Cl.² H01L 7/00

U.S. Cl. 338—35 **10 Claims**



1. A humidity sensor comprising:

a ceramic substrate;

a fired-on pattern of a hygroscopic material in the form of a pair of closely-spaced electrodes;

said material comprising a major proportion of a conductive precious metal and a minor proportion of cobalt oxide; and

means for connecting said electrodes into a circuit.

4,050,049

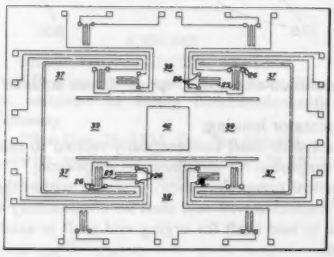
SOLID STATE FORCE TRANSDUCER, SUPPORT AND METHOD OF MAKING SAME

Albert P. Youmans, Cupertino, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Feb. 9, 1976, Ser. No. 656,636

Int. Cl.² H01L 10/10

U.S. Cl. 338—47 **4 Claims**



1. In an integral transducer element and support structure, a semiconductor body having top and bottom surfaces, said body having a recess formed therein extending upward within said body from said bottom surface to define internal side walls and a top wall, the top wall of said recess being spaced from said top surface to form a relatively thin transducer membrane portion within said body at least partially surrounded and supported by said internal side wall portions of said body, said transducer membrane having spaced elongate slots formed therethrough extending from said top wall of said recess to said top surface and being positioned intermediate the side walls of said recess extending to said top surface and terminating short of said side walls, said body having a slot formed about the periphery of said membrane portion at the junction of the recess side and top walls extending to said top surface with portions of said body remaining to integrally support the transducer element thereby formed.

4,050,050

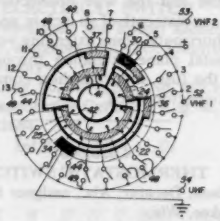
ADJUSTABLE POTENTIOMETER ASSEMBLY

Mutsuo Nakanishi, Villa Park, and Hans Schmidt, Schiller Park, both of Ill., assignors to Matsushita Electric Company of America, Franklin Park, Ill.

Filed May 27, 1975, Ser. No. 580,541

Int. Cl.² H01C 10/48

U.S. Cl. 338—190 **21 Claims**



1. An adjustable potentiometer assembly including in combination:

a multiple-segment, resistive element in said potentiometer assembly;

means for applying direct current operating potential across each segment of said resistive element;

adjustable tap means having at least one tap member mounted in said potentiometer assembly for selecting any desired voltage from any of said segments of said resistive element out of the full range of voltages each segment is capable of producing by locating said tap member in contact with the surface of a resistive segment at different points from which the desired voltage is available;

means for adjusting the relative physical positions of said tap member and said resistive element over a predetermined range to obtain voltage adjustments at each of said different points over a second range of voltages which is less than said full range of voltages, the extremes of said second range of voltages at each different point overlying opposite extremes of the second range of voltages at points adjacent to such point; and

means coupled with said tap member for providing an output voltage from said adjustable potentiometer assembly.

4,050,051

ELECTRIC SLIDER

Ferenc Kádár, and Gyula Galambos, both of Budapest, Hungary, assignors to REMIX Radiotechnikai Vallalat, Budapest, Hungary

Filed Oct. 14, 1975, Ser. No. 622,435

Int. Cl.² H01C 1/12

U.S. Cl. 338—202 **7 Claims**

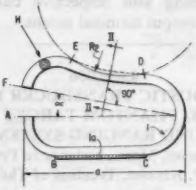
1. In a slider for contacting an electric conductor to effect current transfer between conductor and slider, the slider having a plurality of uniformly spaced, independently springing, aligned resilient contact elements, the improvement wherein each contact element is of elongated C shape having opposite first and second long sides and opposite first and second short sides, said each contact element having a discontinuity at one of the short sides; each contact element having

a. a base portion constituted essentially by said first long side;

b. a springing portion adjoining said base portion and consti-

tuted essentially by said second short side and said second long side; the cross section of said springing portion having a flat configuration along at least one part of said second long side; the length dimension of said flat configuration being oriented substantially perpendicularly to the direction of a springing motion of said second long side towards and away from said first long side;

c. means defining a depression on an outwardly oriented side of said springing portion along said part of flat cross section; said depression having an arcuate course extending in the length dimension of said part of flat cross section;



d. a contact portion adjoining said springing portion and constituted by one part of said first short side; said contact portion including a location of contact for engaging the conductor; the cross section of said contact portion being circular at least in the zone of said contact location; and

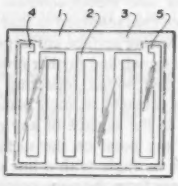
e. connecting means for electrically and mechanically coupling each contact element to an adjacent contact element at said base portion for immobilizing the contact elements with respect to one another at their base portion.

4,050,052

ELECTRICAL TEMPERATURE MEASURING RESISTOR STRUCTURE, PARTICULARLY FOR RESISTANCE THERMOMETERS

Walter Reichelt, Hanau, and Gunter Sauer, Maintal, both of Germany, assignors to W. C. Heraeus GmbH, Hanau, Germany

Filed June 14, 1976, Ser. No. 695,783
Claims priority, application Germany, June 21, 1975, 2527739
Int. Cl.² H01C *1/012, 3/04*
U.S. Cl. 338—308 **17 Claims**



1. Electrical measuring resistor structure for use in resistance thermometers having

a carrier (1) of electrically non-conductive material and a strip of platinum resistance layer (2) applied to the carrier in a predetermined pattern, and comprising the improvement wherein

the carrier comprises a substrate (1) which includes less than 30 parts per million (ppm) Fe, less than 15 ppm Cr, less than 45 ppm Pb and less than 70 ppm Si in a form which can react with the platinum and wherein the sum of said named materials, if more than one is present, does not exceed 20 ppm;

the platinum layer has a thickness of between 0.1 and 10 μm;

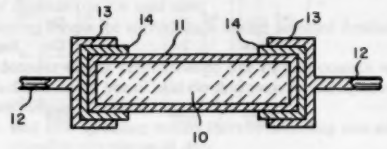
and the mean thermal coefficient of expansion of the substrate differs from the coefficient of expansion of the thermal platinum by less than about ± 30%.

4,050,053

RESISTOR END TERMINATIONS

Gaylord L. Francis, Califon, and Amedeo J. Morelli, Randolph, both of N.J., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 22, 1976, Ser. No. 679,167
Int. Cl.² H01C *1/148, 1/142*
U.S. Cl. 338—332 **1 Claim**



1. A film-type resistor, comprising

an elongated cylindrical substrate;

a resistive film provided adherently on the cylindrical surface of said substrate;

a termination film, composed solely of aluminum, being adherently provided in at least partially laminated relationship relative to portions of said resistive film on the opposed end portions of said cylindrical substrate; and

means for connecting said termination film to a lead, comprising a cap surrounding said end portions of said substrate and in electrical contact with said termination film.

4,050,054

MULTI-CONTACT BRUSH TYPE FISH DETECTING SONAR

Yasunobu Yagita, Maisaka, Japan, assignor to Keisuke Honda, Japan

Filed June 4, 1975, Ser. No. 583,552
Claims priority, application Japan, June 7, 1974, 49-64807; June 7, 1974, 49-66116; Dec. 2, 1974, 49-139048; Dec. 2, 1974, 49-146518
Int. Cl.² G01S *9/70, 7/60*
U.S. Cl. 340—3 F **4 Claims**

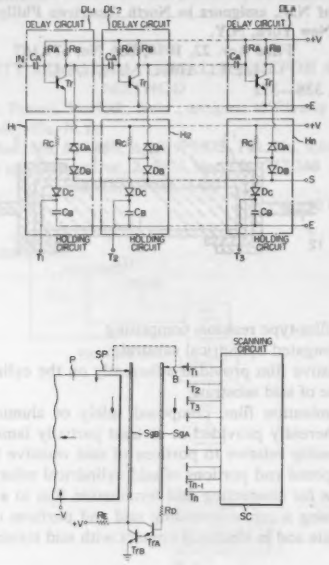
1. A multi-contact brush type fish detecting sonar, comprising

a. a plurality of cascaded delay circuits each having an input terminal, a transistor, a differentiating circuit connecting said input terminal to a base of said transistor, and an output terminal connected to a collector of the transistor the output terminal of each delay circuit being connected to the input terminal of the next succeeding delay circuit;

b. a plurality of holding circuits each having two diodes, a signal input terminal of each holding circuit connected to one of said two diodes, means connecting the other of said two diodes to the corresponding output terminal of one of said delay circuits, a holding signal output terminal, a capacitor means for coupling a terminal of said capacitor to the anodes of said two diodes for holding a sonar return signal to be recorded when a delay output pulse from said corresponding delay circuit and the reflected sonar signal applied to said signal input terminal are concurrently applied to said two diodes; and

c. recorder means with a plurality of contacts connected to

the output terminals of said holding circuits, respectively, a slidable brush, and a recording pen slidable over a recording sheet in unison with said brush which slides over said contacts.

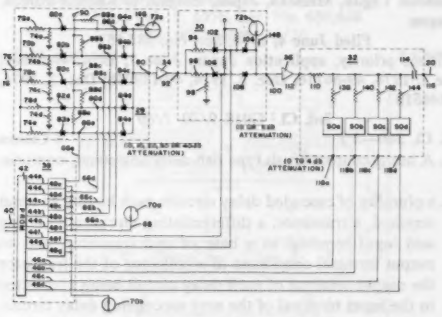


4,050,055

ATTENUATOR CIRCUIT ULTRASONIC TESTING

Christopher C. DiLeo, Brewster, N.Y., assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed July 26, 1976, Ser. No. 708,556
Int. Cl.² G01S 9/66
U.S. Cl. 340—1 R **13 Claims**



1. A pulse-echo ultrasonic apparatus including an attenuating means disposed in the electrical signal path from a transducer probe to a receiver circuit, said attenuating means comprising in combination;

input terminal means and output terminal means;

a signal attenuating network having a plurality of parallel connected impedance circuits coupled between said input terminal and output terminal means;

each of said impedance circuits comprising attenuating means and a pair of in-opposition connected unidirectional current conductive means;

constant current means coupled to each of said impedance circuits, and

control means which includes further constant current means and switch means coupled to each of said impedance circuits for causing, responsive to the selective operation of said switch means, current flow between said constant current means and said further constant current means through a respective unidirectional current conductive means of a pair of such conductive means,

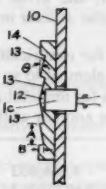
whereby to provide for the passage of an electrical signal from said input terminal means over a selected impedance circuit containing said respective current conductive means to said output terminal means.

4,050,056

ELECTROACOUSTIC TRANSDUCER DESIGN FOR ELIMINATING PHANTOM TARGET ERRORS IN SOUND RANGING SYSTEMS

Frank Massa, Cohasset, Mass., assignor to Fred M. Dollorfano, Jr. and Donald P. Amassa, Trustees of The Stoneleigh Trust, Cohasset, Mass.

Filed Nov. 10, 1975, Ser. No. 630,364
Int. Cl.² G01S 9/66; H04R 1/34
U.S. Cl. 340—1 R **5 Claims**



3. In combination, a directional electroacoustic transducer adaptable for use in a sound-ranging system for the detection of a sound reflecting target and elimination of multiple reflections, means for the detection of said sound reflecting target which includes the reception and recognition of an acoustic signal arriving from the target along an axis which includes the target and the directional transducer, a sound reflecting surface in the vicinity of said electroacoustic transducer, said sound reflecting surface characterized in that the linear dimensions of said sound reflecting surface are larger than the wavelength of said acoustic signal, and further characterized in that the configuration of said sound reflecting surface includes sound reflecting areas oriented in such manner that any line drawn perpendicular to the surface of any of the said sound reflecting areas from any point on the surface of said sound reflecting areas makes an angle with a line drawn parallel to the axis of the transducer from the same point on the surface of said sound reflecting area which is greater than one-half the beam angle of the transducer, the beam angle of the transducer being defined as the angle corresponding to the −3 dB points in the directional response characteristic of the transducer.

4,050,057

DATA SAMPLE RECORDING SYSTEM

William R. Backman, Jr., Portsmouth, and Mark A. Chramiec, Newport, both of R.I., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 2, 1976, Ser. No. 673,229
Int. Cl.² G01S 7/60
U.S. Cl. 340—3 F **7 Claims**

1. A recording system comprising:

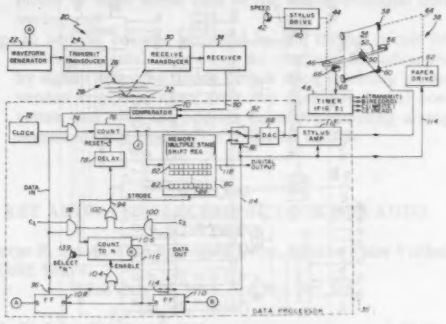
a recorder for recording data of a signal, said recorder having a recording medium and means for printing marks thereupon, there being a predetermined number of resolu-

tion elements across said medium for the printing of said marks;

means synchronized to said printing means for initiating a data sampling interval and a data printing interval;

means coupled to said initiating means for repetitively sampling said signal during said data sampling interval to produce a series of samples, said sampling means including means for selecting one sample of said series of samples during each of a number of subintervals of said data sampling interval, said number of subintervals being equal to said predetermined number;

means for varying the duration of said data sampling interval



while retaining said predetermined number of subintervals; and

means synchronized to said printing means for feeding samples selected by said selecting means to said printing means during said data printing interval.

2. A system according to claim **1** wherein said data is the distance of a reflecting surface within a medium propagative of radiant energy, said system further comprising means coupled to said initiating means for transmitting a radiant energy signal toward said reflecting surface at the beginning of said data sampling interval and means coupled to said sampling means for receiving a radiant energy signal reflected by said reflecting surface.

4,050,058

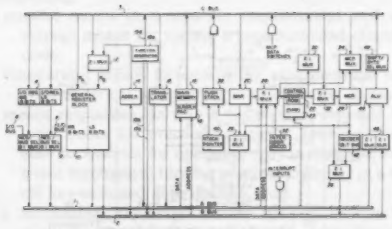
MICROPROCESSOR WITH PARALLEL OPERATION

Richard A. Garlic, Irvine, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 428,651, Dec. 26, 1973. This application Oct. 24, 1975, Ser. No. 625,627

Int. Cl.[2] G06F *3/00*

U.S. Cl. 364—200 **10 Claims**



1. A microprocessor comprising:

a. a control memory for storing control words,

b. a clock for generating a train of clock signals,

c. a first bus,

d. a second bus,

e. means connecting said first bus and said second bus,

f. a plurality of sources of data,

g. a plurality of destinations for storing data,

h. first selecting means for selecting one of said plurality of sources of data,

i. placing means for placing data from said selected source on said first bus,

j. said connecting means comprising transferring means for transferring data from said first bus to said second bus,

k. second selecting means for selecting one of said plurality of destinations for said data,

l. storing means for storing data in said selected destination, and

m. decoder means responsive to one of said control words and to a single one of said clock signals for simultaneously activating:

1. said first selecting means thereby selecting one of said plurality of sources of data,

2. said placing means thereby placing data from said selected source on said first bus,

3. said transferring means thereby transferring said data from said first bus to said second bus,

4. said second selecting means thereby selecting one of said destinations for said data, and

5. said storing means thereby storing said data on said second bus in said selected destinations whereby highly parallel operation of said microprocessor is enabled during a single clock cycle by said simultaneous activation of said first and second selecting means, said placing, transferring and storing means by said decoder means.

4,050,059

DATA PROCESSING READ AND HOLD FACILITY

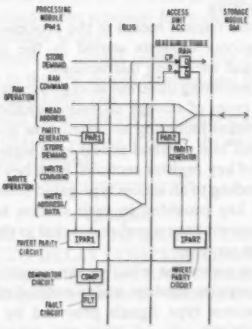
John Lloyd Williams, Cambridge; Roger John Leaman, Maidenhead; Robert Valentine Moberly, Poole; Geoffrey Brian Kenneth Stagg, and Graham John Wisdom, both of Wimborne, all of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Apr. 30, 1976, Ser. No. 682,015

Claims priority, application United Kingdom, May 1, 1975, 18129/75

Int. Cl.[2] G06F *11/10*

U.S. Cl. 364—200 **2 Claims**



1. A data processing system comprising in combination (i) a plurality of processing modules, each of said processing modules having means for initiating read, write, or read-and-hold operations, (ii) a common memory having a plurality of storage modules, (iii) individual highway busses for connecting each processing module to all storage modules for read, write or read-and-hold storage module access operations, (iv) means for generating, in each storage module, a parity indication indicative of the address of the storage location accessed by a processing module which indication is returned by way of the connecting highway bus to the accessing module in response to

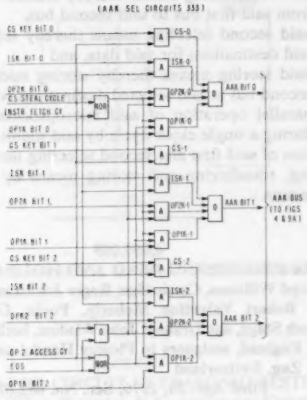
a storage module access operation and means for inverting in each storage module the parity indication returned during a write operation which follows immediately after a read-and-hold operation, (v) means for generating, in each processing module, the expected parity indication and (vi) means for comparing, in each processing module, the expected parity indication with the returned parity indication and for initiating a fault condition if the two parity indications are different.

4,050,060

EQUATE OPERAND ADDRESS SPACE CONTROL SYSTEM

Richard Eugene Birney, and Robert Allen Hood, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,221
Int. Cl.[2] G06F 9/20
U.S. Cl. 364—200 **6 Claims**



1. A system for protecting the contents of main storage of a processor using a plurality of storage protect keys operated by the processor having an equateoperand spaces (EOS) control feature, comprising

storage access request means in the processor for signalling storage access requests sensed in the processor while fetching and executing instructions,

means for generating different storage access type signals for different types of storage accesses signalled by the access request means including an instruction access type signal and at least one operand access type signal,

a plurality of key register sections, each key register section corresponding to an access type gated from the generating means, a key provided in each section being associated with the access type signal connected to the outgate of the respective section,

key selection means for selecting the outgates of the respective key register sections under control of the respective storage access type signals provided by the generating means,

an equate-operand-spaces (EOS) latch which is set and reset by execution of predetermined instructions by the processor,

first means for disabling one key register outgate in response to the setting of the EOS latch, and

second means for enabling another outgate in response to activation of the storage access type signal connected to the one outgate when the EOS latch is set,

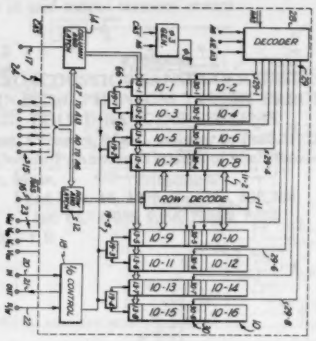
whereby when the EOS latch is set, the another outgate selects the key contained in another key register section instead of the key in the key register section associated with the one outgate; but when the EOS latch is reset, the one outgate being enabled to select the key in the associated key section.

4,050,061

PARTITIONING OF MOS RANDOM ACCESS MEMORY ARRAY

Norihisa Kitagawa, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 3, 1976, Ser. No. 682,685
Int. Cl.[2] G11C 7/06, 8/00
U.S. Cl. 340—173 R **10 Claims**



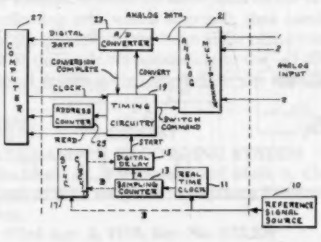
8. A semiconductor memory system comprising a memory array containing a large number of memory cells, means for addressing the memory array by a multi-bit address, first and second decoders for receiving the address and selecting parts of the array for access, the array being partitioned into two groups of pairs of blocks, the first decoder being between the two groups and selecting one of the groups for actuation for refresh and selecting one line in a group, the second decoder being duplicated and located at an end of each group to select a line in each group, and a third decoder for receiving a part of the address and actuating only one pair of blocks for a given address.

4,050,062

SYSTEM FOR DIGITIZING AND INTERFACING ANALOG DATA FOR A DIGITAL COMPUTER

Thomas H. Crocker, Burlington; Barry N. Levitt, Framingham, and Paul J. Suprenant, Chelmsford, all of Mass., assignors to The United States of America as represented bythe Secretary of the Air Force, Washington, D.C.

Filed Aug. 14, 1975, Ser. No. 604,527
Int. Cl.[2] G08C 15/06
U.S. Cl. 340—183 **6 Claims**



1. A system for interfacing a plurality of amplitude modulated signals with a digital computer comprising:

a. an analog multiplexer fed by the plurality of amplitude modulated signals;

b. an analog-to-digital converter fed by the analog multi-

plexer and read into the computer upon a read command, and with the analog-to-digital converter generating a conversion complete signal;

c. a timing circuit generating an initializing switch command for advancing the analog multiplexer, a convert command to the analog-to-digital converter, and a read command to the computer;

d. an alternating reference signal source having the same frequency as the plurality of amplitude modulated signals;

e. a real time clock connected to and synchronous with the alternating reference signal;

f. a sample counter fed by the real time clock and generating a start pulse to the timing circuit for initializing the multiplexer to input initial data to the analog-to-digital converter; and

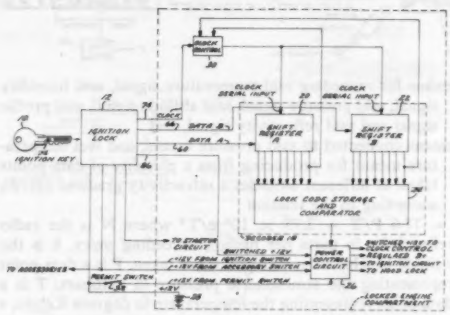
g. an address counter activated by the timing circuit for entering an initial address into the computer and advanced by signals from the timing circuit upon receiving a conversion complete signal from the analog-to-digital converter, and with the address counter generating a stop command upon completion of digital read-in.

4,050,063

KEY ACTUATED ELECTRONIC LOCK FOR AUTO IGNITIONS

George R. Schull, 6778 Eddinghill Drive, Rancho Palos Verdes, Calif. 90274

Filed July 14, 1975, Ser. No. 595,545
Int. Cl.[2] H04Q *3/00*
U.S. Cl. 340—274 C **8 Claims**



1. A mechanical-electronic lock system for actuating auto ignitions and the like only upon sequential electronic and mechanical unlocking operations including a matching of a stored electronic lock code with an electronic key code generated as a key is being inserted into a lock cylinder followed by a mechanical turning of the key in the cylinder, the lock system comprising:

control means in a separate compartment and including storage means for storing a predetermined electrical lock code,

comparator means for comparing said electrical lock code with electrical input codes to said control means, and

means responsive only to a match between said lock and input codes for preconditioning an auto ignition and/or auto accessories for operating only in response to a subsequent mechanical turning of a lock cylinder in a mechanical key-actuated auto ignition lock:

a mechanical key-actuated auto ignition lock including a manually turnable lock cylinder for actuating said auto ignition and/or said auto accessories only after a preconditioning thereof by said control means followed by a turning of said lock cylinder, said cylinder having a keyway for receiving a mating ignition key for turning said lock cylinder in response to a turning of said mating ignition key;

a mating ignition key insertable into said keyway for turning said lock cylinder in response to a manual turning of said key and carrying a key code on a side face of said key, said key code matching said lock code;

transducer means in said auto ignition lock for reading said key code and generating an electrical key code indicative of said key code as said key is being inserted into said keyway; and

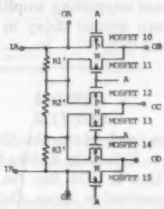
means for applying said electrical key code to said control means as an electrical input code for comparison and matching with said electrical lock code to precondition said auto ignition and/or accessories.

4,050,064

FOUR-LEVEL VOLTAGE SUPPLY FOR LIQUID CRYSTAL DISPLAY

Shitaro Hashimoto, Shiki, and Yuuichi Sato, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 11, 1976, Ser. No. 685,261
Claims priority, application Japan, May 14, 1975, 50-57649
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 M **11 Claims**



1. Voltage supply circuitry for supplying to a liquid crystal display first, second and third voltage levels in addition to a reference level, comprising:

first and second input terminals, the first input terminal being connected to the first voltage level and the second input terminal being connected to the reference level;

first, second, third, fourth and fifth output terminals for providing desired voltage levels to the liquid crystal display;

impedance means interposed between the first input terminal and the second input terminal for producing the second and third voltage levels;

connection means for always providing the first and reference levels to the first output terminal and the fifth output terminal respectively; and

switching means for selectively providing the first, second, third and reference voltage levels to the second, third and fourth output terminals.

4,050,065

DUAL SLOPE ANALOG TO DIGITAL CONVERTER WITH DELAY COMPENSATION

Gerald Mosley, Melrose Park, and Ervin T. Raber, Norristown, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed May 22, 1975, Ser. No. 579,762
Int. Cl.[2] H03K *13/20*
U.S. Cl. 340—347 NT **5 Claims**

2. An improved precision dual slope analog to digital converter having an input signal sample integration period and a reference integration period comprising

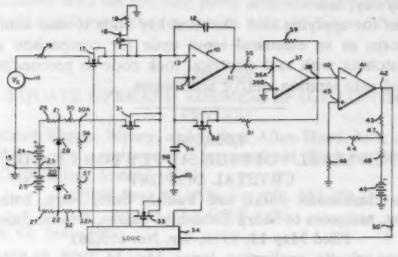
amplifier means including an integrating amplifier for performing said input signal sample integration and said reference integration,

a source of reference voltage,

switching means for applying to said integrating amplifier means during said reference integration period a first signal from said source of reference voltage to produce a

ramp change in the output of said integrating amplifier, and

delay compensation circuit means connected between said source of reference voltage and said amplifier means for applying to said integrating amplifier means throughout



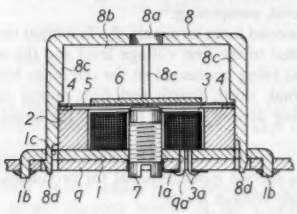
said reference integration period a second signal from said source of reference voltage to produce a step change in the output of said integrating amplifier to compensate for the inherent turn around delay in the response of said amplifier means.

4,050,066

BUZZER

Takeshi Yanagisawa, and Motoyuki Osuga, both of Tokyo, Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Oct. 6, 1976, Ser. No. 730,085
Claims priority, application Japan, Oct. 9, 1975, 50-121998
Int. Cl.² G01K 9/12
U.S. Cl. 340—388 **4 Claims**



1. A buzzer comprising; an annular magnet, a coil disposed at the inside of said magnet, a vibration plate disposed above said magnet, a core inserted into the central opening of said coil with its one end facing said vibration plate, yoke and a case, wherein said magnet, said vibration plate and said yoke are held one another by magnetic attraction of said magnet.

4,050,067

AIRBORNE MICROWAVE PATH MODELING SYSTEM

Ethelbert P. Elmore, Jr., Hernon House 1103, Reston, Va. 22090

Filed Apr. 21, 1976, Ser. No. 679,082
Int. Cl.² G01S 9/00; G01D 9/08
U.S. Cl. 343—5 R **6 Claims**

1. An airborne geophysical measurement and recording system comprising:

radar means for producing a focused radar signal, directing said signal to a terrain area below said aircraft and successively receiving a return signal from said terrain area,

a linear range circuit connected to the output of said radar means for successively producing radar range signals from said return signal indicating the highest obstruction in said terrain area,

an amplitude circuit connected to the output of said radar means for producing an echo magnitude signal which varies as a function of the maximum echo magnitude of said return signal,

temperature means for detecting the atmospheric temperature and producing a temperature signal which varies as a function thereof,

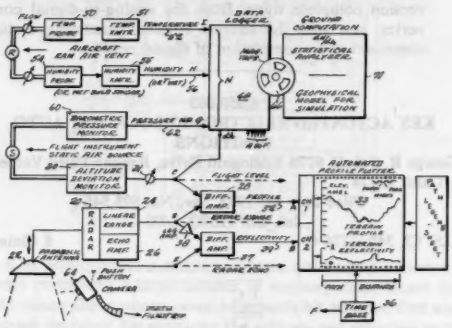
humidity means for detecting atmospheric humidity and producing a humidity signal which varies as a function thereof,

aircraft height means for detecting aircraft altitude and producing an altitude signal,

profile means for producing a profile signal which varies as a function of the difference between said range signal and said altitude signal,

reflectivity means for producing a reflectivity signal which varies as a function of said echo magnitude signal,

pressure means for detecting absolute atmospheric pressure and producing a pressure signal,



means for recording said temperature signal, said humidity signal, said pressure signal, said altitude signal, said profile signal and said reflectivity signal, and

means connected to said pressure means, and wet temperature means for producing from a plurality of data points taken at different altitudes a refractivity gradient dN/dh according to the relation

$N = 77.6\ P/T + 3.73 \times 10^5\ e/T^2$ where N is the radio refractivity in parts per million exceeding unity, h is the altitude at which the data points are taken, P is a data point representing the atmospheric pressure in millibars, T is a data point representing the temperature in degrees Kelvin, e is a data point representing the partial pressure of water vapor in millibars, and dN/dh is the refractivity gradient per kilometer of height in the lower air layer traversed by the microwave beam.

4,050,068

AUGMENTED TRACKING SYSTEM

Robert L. Berg, St. Louis; William J. Murphy, Frontenac, and Dennis E. Simmons, Jr., Bridgeton, all of Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 15, 1976, Ser. No. 667,041
Int. Cl.² G01S 9/02
U.S. Cl. 343—6 R **5 Claims**

1. An augmented tracking apparatus comprising in combination

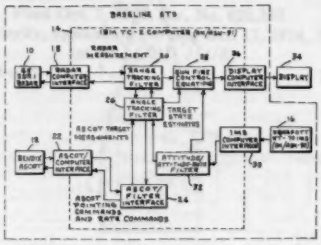
a radar sensor to provide range data

an electro-optical sensor to provide angle data

an inertial platform to provide inertial frame of reference data, said inertial platform sensing any change in aircraft attitude from said inertial frame of reference and providing attitude data corresponding to said change, and,

a computing means connected to said radar sensor and said electro-critical sensor to respectively receive said range data and said angle data, said computing means connected to said inertial platform to receive said inertial frame of reference data and said attitude data, said computing means processing said range, angle and attitude data to

provide target state data, said computing means providing pointing commands to said electro-optical sensor, said electro-optical sensor responding to said pointing commands to scan a preselected area about the predicted target position said electro-optical sensor being a non-imaging electro-optical sensor.

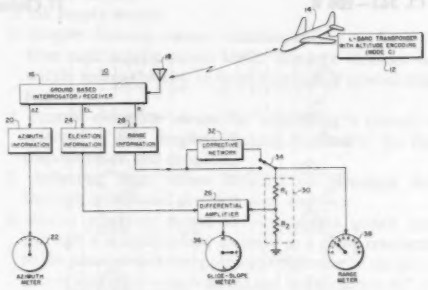


4,050,069

TRANSPONDER BASED LANDING SYSTEM

Henry Schlussler, Lincroft, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 2, 1976, Ser. No. 719,790
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.5 R **10 Claims**



1. A landing approach system for aircraft having a transponder which includes means for automatically transmitting encoded altimeter information when said aircraft transponder is interrogated, said system comprising:

a ground based interrogator/receiver unit for interrogating said aircraft transponder and adapted to receive response signals therefrom including said encoded altimeter information, the electronic center of said land based transponder antenna being aligned with the center line of a prescribed landing runway;

means in circuit with said ground based unit for processing said response signal for respectively determining the azimuth of said aircraft relative to said runway, and the range of said aircraft to the point of touchdown on said runway;

means in circuit with said ground based unit for decoding said encoded altimeter information to produce signals corresponding to the elevation reported from said aircraft;

means responsive to the output of said range determining means for generating signals corresponding to a ground distance and a vertical approach path for said aircraft whereby a glide path for said aircraft is prescribed, said vertical approach path signals being a fixed proportion of said ground distance signals; and

means for comparing said vertical approach path signals with said aircraft elevation reported signals to produce error signals corresponding to the difference therebetween;

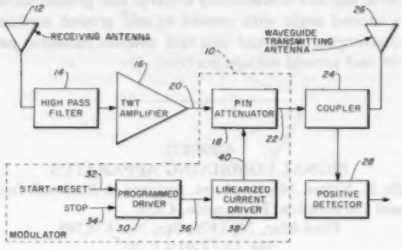
said azimuth, range and error signals comprising the information for guiding said aircraft along said glide path.

4,050,070

PROGRAMMABLE MICROWAVE MODULATOR

Lawrence A. Beno, Camarillo, and Kazumasa Doi, Ventura, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 1, 1976, Ser. No. 691,923
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.8 LC **12 Claims**



1. A programmable microwave modulator comprising:

a. means for providing a radio frequency signal from a receiving antenna;

b. programmable driver means for providing a linear analog signal that is predetermined both as to amplitude pattern and time period;

c. attenuator means responsive to said linear analog signal for attenuating said radio frequency signal; and

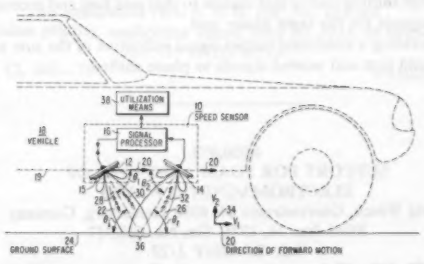
d. linearizing current driver means connected between said programmable driver means and said attenuator means for operating on said linear analog signal such that said radio frequency signal is attenuated by said attenuator means as a linear function of said linear analog signal.

4,050,071

BI-STATIC RADAR SPEED SENSOR

Alvin Seymour Clorfeine, Adelphi, Md., assignor to RCA Corporation, New York, N.Y.

Filed May 17, 1976, Ser. No. 687,142
Int. Cl.[2] G01S 9/42
U.S. Cl. 343—8 **6 Claims**



1. In an apparatus, cooperating with a vehicle having forward and rearward portions along a longitudinal axis, for sensing the speed of motion of said vehicle with respect to a ground surface in a forward direction substantially parallel to said longitudinal axis and substantially parallel to said ground surface, said apparatus being of the type including first means for transmitting a probe signal to said ground surface, second

means for receiving signals reflected from said ground surface and third means, responsive to signals respectively indicative of said probe signal and said reflected signals for generating a signal indicative of said speed, the improvement wherein:

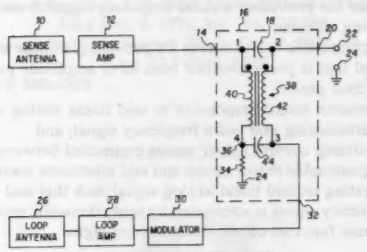
said second means comprises at least first and second antennas each of said antennas receiving a portion of said reflected signals, said first antenna having a radiation pattern disposed facing forwardly in a direction substantially parallel to said longitudinal axis and downwardly towards said ground surface at a first angle with respect to said ground surface, said first antenna radiation pattern covering a portion of said ground surface; and said second antenna having a radiation pattern disposed facing rearwardly in a direction substantially parallel to said longitudinal axis and downwardly towards said ground surface at a second angle with respect to said ground surface and converging with and said first antenna radiation pattern on said ground surface portion.

4,050,072

SIGNAL COMBINING APPARATUS

Orville K. Nyhus, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 26, 1976, Ser. No. 670,769
Int. Cl.² G01S 3/20
U.S. Cl. 343—121 **11 Claims**



6. The method of combining two out-of-phase signals to produce a resultant signal indicative of an in-phase combination comprising, the steps of:

supplying a first in-phase signal to a first winding of a transformer;

supplying a second quadrature phase signal to a second winding of said transformer;

phase shifting one of said signals so that said first and second signals are the same phase; and

providing a combined output signal indicative of the sum of said first and second signals as phase shifted.

4,050,073

SUPPORT FOR FOAM ABSORBER OF ELECTROMAGNETIC WAVES

Ludwig Wesch, Goerrestrasse 54, 6900 Heidelberg, Germany

Filed Jan. 14, 1976, Ser. No. 648,937
Int. Cl.² H01P 1/22
U.S. Cl. 343—18 A **4 Claims**

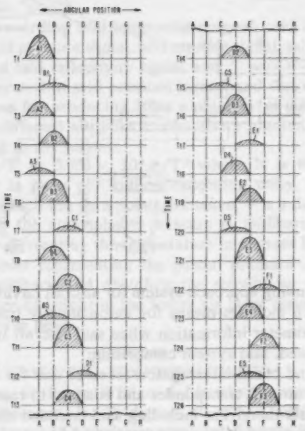
1. In a foam-type absorber of electromagnetic waves, a reinforcing framework comprising, in combination, a plurality of elongated outer support elements disposed in spaced relation and oriented to define the longitudinal edges of a pyramid, and a heat-hardenable strand wound in reentrant roving fashion about the support elements to define, between each adjacent pair of the support elements, a lattice-shaped lateral wall having a plurality of substantially diamond-shaped apertures therein, the lattice-shaped wall and the support elements cooperating to define a chamber, and foam-type electromagnetic absorbing means supported within the chamber.

4,050,074

BLENDED STEP SCAN BEAM SIGNAL FROM FIXED BEAM COMPONENTS

Donald J. Toman, Pleasantville, N.Y., assignor to Tull Aviation Corporation, Armonk, N.Y.

Filed July 16, 1976, Ser. No. 706,020
Int. Cl.² G01S 1/16, 1/54
U.S. Cl. 343—106 R **27 Claims**



1. A method of synthesizing a continuous scanning beam of radio energy from an array of fixed antenna elements having radiation beam ports aimed radially outwardly to different angles in the arc over which the scanning beam is to be scanned, comprising

rapidly switching the radio frequency energy from a transmitter in a repeating sequence of bursts of radio frequency energy to illuminate the different ones of the radiation beam ports at a switching frequency which is substantially greater than the rate of successive interception of the scanning beam to by synthesized with the individual radiation beam port positions,

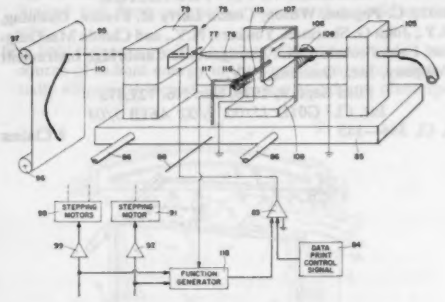
and modulating the energy levels of the individual bursts of radio frequency energy in a predetermined program to provide a composite beam energy profile which is a synthesized directional beam which is moving at a predetermined desired scanning rate.

4,050,075

INK JET METHOD AND APPARATUS

Carl Hellmuth Hertz, Skolbanksvagen 8, S-223 67, and Jan Birger Franz Welinder, c/o Lund Institute of Technology, both of Lund, Sweden

Filed Oct. 7, 1975, Ser. No. 620,358
Claims priority, application Sweden, Oct. 17, 1974, 74130782
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 2 Claims



1. An ink-jet printer apparatus, comprising in combination

a. receptor means on the surface of which a plot or drawing is formed to comprise at least one line of predetermined width;

b. an ink-jet system comprising in combination

1. nozzle means,

2. ink supply means,

3. droplet forming means including means to force ink from said supply means under pressure through said nozzle means thereby to form a stream of spaced droplets,

4. control electrode means for impressing a charge on selected of said droplets thereby to control the final disposition of said droplets,

5. deflecting plate means defining on electrical field through which said droplets pass, and

6. nozzle vibrating means to vibrate said nozzle both through a predetermined distance in a plane transverse to the plane of said receptor and transverse to the direction of said relative movement and in a direction 90° out of phase with said means to vibrate it transverse to said direction of said relative movement;

c. data print control signal means to transmit signals to said electrode means predeterminative of said final disposition of said droplets whereby the magnitude of said charge on each of said droplets is determined by said signals;

d. traveling carriage means on which said ink jet system is mounted;

e. means to effect relative movement between said carriage means and said receptor, said relative movement being variable with respect to both velocity and direction;

f. data position signal means to control relative movement between said receptor means and said traveling carriage means;

g. means for sensing at least one relative velocity function between said carriage means and said receptor substrate means;

h. means for sensing the movements of vibration of said nozzle;

i. means to generate a function of said vibration movements;

j. means to combine said function of said vibration movements with said at least one relative function thereby to generate a combined relative velocity function; and

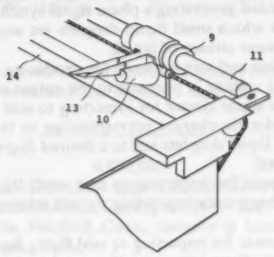
k. means for controlling the signal from said data print control signal means as a function of said relative combined functions.

4,050,076

DEFLECTION MEANS INCLUDING A DEFLECTION ELECTRODE MOUNTED ON A TRAVELLING CARRIAGE IN AN INK JET SYSTEM PRINTER

Rikuo Takano, Musashino; Tamaki Saito, Koganei; Yuji Sumitomo, Nara; Toshio Kobayashi, Osaka; Yoichi Yamamoto, Nara; Fumio Siozaki, and Tokio Maezawa, both of Yamatokoriyama, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Sharp Kabushiki Kaisha, both of Musashino, Japan

Filed Aug. 17, 1976, Ser. No. 715,007
Claims priority, application Japan, Aug. 18, 1975, 50-100370
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 10 Claims



1. An ink jet system printer of the charge amplitude controlling type which emits charged ink droplets from a printing head toward a record receiving member, said system comprising a stationary body and a carriage, said printing head being carried by a carriage travelling in the lateral direction across the body, means for selectively deflecting said ink droplets by deflection means, and recording desired symbols on said record receiving member with said selectively deflected ink droplets, the deflection means comprising:

a plate shaped slim electrode mounted on the carriage;

a counter electrode mounted on a fixed support means with respect to the body of the ink jet system printer; and

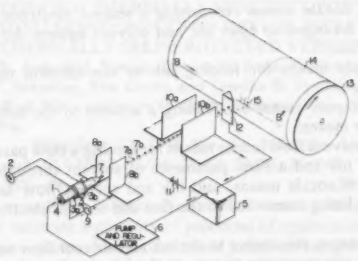
a high-voltage source to establish a high-voltage electric field between the plate shaped slim electrode mounted on the carriage and the counter electrode mounted on the body of the ink jet system printer.

4,050,077

LIQUID DROPLET SUPPLYING SYSTEM

Takahiro Yamada, and Tetsuo Doi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 473,899, May 28, 1974, abandoned.
This application Nov. 6, 1975, Ser. No. 629,566
Claims priority, application Japan, May 30, 1973, 48-59834
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 9 Claims



1. A liquid droplet supplying system comprising:

a liquid jet nozzle having a predetermined diameter for

jetting a liquid material with predetermined characteristics under predetermined pressure;

vibration imparting means for mechanically vibrating said nozzle at a predetermined frequency;

electrical means for applying a predetermined electrical signal to the vibration imparting means for controlling said vibration imparting means, the nozzle diameter, pressure and characteristics of the liquid material, the vibrating frequency of the nozzle and the electrical signal applied to the vibration imparting means being cooperable for causing an end portion of a columnar stream of liquid jetted from said nozzle to separate into an alternate series of large liquid droplets and small liquid droplets and to fly said liquid droplets;

a phase signal circuit for receiving a signal from said electrical means and generating a phase signal synchronous with a phase at which small liquid droplets are separated from said columnar stream of liquid;

an information and signal source for producing an information signal voltage in response to the output signal of said first phase signal circuit for imparting to said small liquid droplets electric charges corresponding to the weight of said small liquid droplets and to a desired degree of deflection thereof;

charging means for imparting to said small liquid droplets electric charges corresponding to said information signal voltage;

deflecting means for imparting to said flying liquid droplets a deflection force corresponding to electric charges applied thereto; and

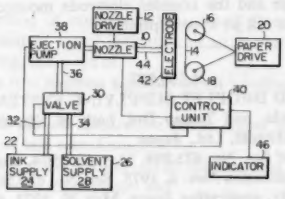
collecting means for collecting as they are flown either the liquid droplets subjected to said degree of deflectin or non-deflected liquid droplets.

4,050,078

AUTOMATIC NOZZLE CLEANING SYSTEM FOR INK EJECTION PRINTER

Takuro Isayama, and Kikuo Kubo, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 5, 1975, Ser. No. 638,136
Claims priority, application Japan, Dec. 9, 1974, 49-141760
Int. Cl.² G01D *18/00*
U.S. Cl. 346—140 R **9 Claims**



1. Ink ejecting apparatus comprising:

a first electrode;

ejection nozzle means comprising a second electrode and being arranged to eject ink and solvent against the first electrode;

ink supply means for feeding ink to the ejection nozzle means;

solvent supply means for feeding a solvent to the ejection nozzle means;

ink and solvent flow sensor means for sensing a flow parameter of ink and a flow parameter of solvent through the ejection nozzle means, said ink and solvent flow sensor means being connected to the first and second electrodes; and

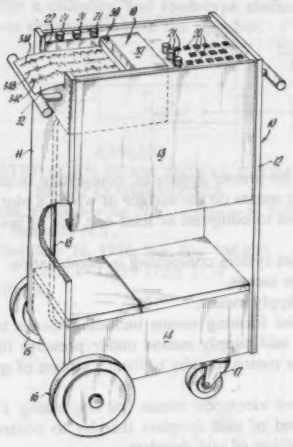
control means responsive to the ink and solvent flow sensor means and operative to actuate the ink supply means and de-actuate the solvent supply means when the sensed ink flow parameter is above a first predetermined value and to actuate the solvent supply means and de-actuate the ink supply means when the sensed ink flow parameter is below the first predetermined value, and further operative to de-actuate the solvent supply means and re-actuate the ink supply means when the solvent flow parameter exceeds a second predetermined value.

4,050,079

ELECTROCARDIOGRAPHIC APPARATUS WITH RECORDING PEN PROTECTOR

Timothy C. Pegnim, Wilton, Conn.; Larry R. France, Ossining, N.Y.; John G. Sherman, Yonkers, N.Y., and Claude MacQuignon, Lake Peekskill, N.Y., assignors to Cambridge Instrument Company, Inc., Ossining, N.Y.

Filed Sept. 9, 1976, Ser. No. 721,873
Int. Cl.² G01D *15/00, 9/00;* A61B *5/04*
U.S. Cl. 346—145 **8 Claims**



1. In electrocardiographic apparatus including means for amplifying and recording signals from a patient, a housing of insulating material wholly enclosing said amplifying means, recording means including a platen roller for retaining and feeding a recording medium about said roller, at least one pen having means for activating it in response to said signals for recording them on said medium as the latter passes over said platen roller, means for displacing said platen roller from engagement with said pen for replenishment of said medium and an insulating barrier movable to shield said pens from accidental grounding in response to the displacement of said platen roller.

4,050,080

CRT SCREEN EXPOSURE DEVICE UTILIZING IMPROVED LIGHT MEANS

Stanley Leonard Pawlikowski, Seneca Falls, and Carl William Penird, Waterloo, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

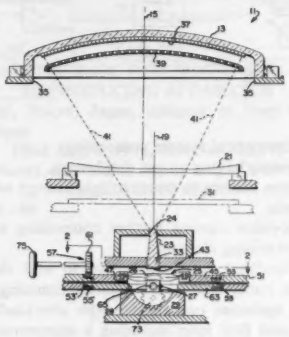
Filed Apr. 2, 1976, Ser. No. 672,968
Int. Cl.² G03C *5/00*
U.S. Cl. 354—1 **3 Claims**

1. An improvement in a cathode ray tube screen exposure device having an axis therethrough wherein an internally positioned optical system is employed to selectively photoexpose a patterned screen structure on a CRT viewing panel having a sensitized coating disposed thereon in spatial relation to a multi-apertured grid oriented thereover, said optical system having an axis and including a defined light output area, related source means of radiant energy and associated reflective means, said improvement relating to said optical system

and particularly to the radiant energy source means incorporated therein comprising:

alpha light means providing a substantially concentrated alpha source of radiant energy in the form of a substantially ellipsoidal incandescence positioned in a plane spatially and proximally related to the plane of said light output area and substantially normal to said optical axis to effect substantially centered orientation of said alpha source of radiant energy on said optical axis, said alpha light means being supported to be arcually movable in a limited and finely adjustable manner about said optical axis;

beta light means providing a substantially concentrated beta source of radiant energy in the form of a second substantially ellipsoidal incandescence positioned in a plane spa-



tially related to and parallel with the plane of said alpha light means to effect substantially centered orientation of said beta source of radiant energy on said optical axis, said beta light means being superjacently positioned on said axis in substantially angularly crossed relationship with said alpha light means and supported to be arcually movable in a limited and finely adjustable manner about said optical axis, said alpha and beta light means being arcually adjusted to provide an optimized conjunctive output of radiant energy substantially along said axis; and

a reflective means associated with said alpha and beta sources of radiant energy, said reflective means having a substantially concave surface fashioned to provide an optimized conjuncture of reflected energy directed toward said light output area.

4,050,081

EXPOSURE AREA CONTROL FOR AN OPTICAL SCANNING SYSTEM FOR MANUFACTURING CATHODE RAY TUBES

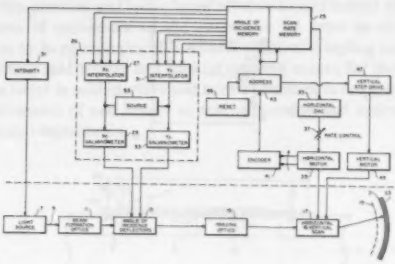
Thomas W. Schultz, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 23, 1976, Ser. No. 699,046

Int. Cl.[2] G03B *41/00*

U.S. Cl. 354—1 **13 Claims**

1. In a control system for use with an optical scanning exposure system in manufacturing cathode ray tubes having a faceplate with a layer of photosensitive material thereon, said optical scanning exposure system including a light source with a wavelength spectrum for exposing the photosensitive material, means for scanning the faceplate with a light beam, and means for deflecting the light beam at an angle related to the angle of incidence of an electron beam in a cathode ray tube, and said electrical control system including an angle of incidence and scan rate memory means; a scan rate means for controlling scanning of the light beam, and an angle of incidence control means for controlling the angle of incidence of the light beam, the improvement comprising means for providing a source of signals for combination with a signal from said angle of incidence control means and coupled to said angle of incidence deflector means to cause movement of the effective light beam source in a source plane and provide an increased



area of partial exposure and a decreased area of full exposure of said faceplate whereby the exposure area size and shape is controlled.

4,050,082

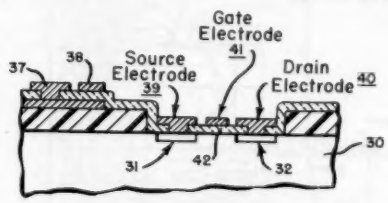
GLASS SWITCHING DEVICE USING AN ION IMPERMEABLE GLASS ACTIVE LAYER

Seymour Merrin, Fairfield, Conn., assignor to Innotech Corporation, Norwalk, Conn.

Continuation of Ser. No. 415,432, Nov. 13, 1973, abandoned, which is a division of Ser. No. 122,302, March 9, 1971, Pat. No. 3,801,878. This application July 15, 1975, Ser. No. 596,147

Int. Cl.[2] H01L *45/00*

U.S. Cl. 357—2 **13 Claims**



1. A circuit comprising crystalline semiconductor substrate, one or more p-n junctions formed therein, a passivating layer disposed thereupon and including one or more glass switching devices comprising a layer of ionically impermeable glass disposed between a pair of electrodes, said circuit characterized in that said passivating layer is comprised of the same composition of glass as the glass utilized in said switching device.

4,050,083

INTEGRATED THERMALLY SENSITIVE POWER SWITCHING SEMICONDUCTOR DEVICE, INCLUDING A THERMALLY SELF-PROTECTED VERSION

Stanley V. Jaskolski, Sussex; Robert W. Lade, Waukesha; Herman P. Schutten, Elm Grove, and Gordon B. Spellman, Mequon, all of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

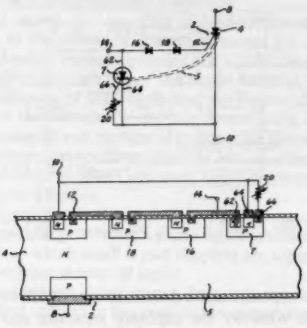
Filed Sept. 22, 1976, Ser. No. 725,626

Int. Cl.[2] H01L *23/56, 29/66, 29/74, 29/747*

U.S. Cl. 357—28 **30 Claims**

1. A monolithic semiconductor device comprising on a common substrate a plurality of junctions of opposite conductivity type regions, at least one of said junctions being a power switching junction having a current blocking off state and a current passing on state whereby to exhibit a current switching characteristic, at least another of said junctions being a temperature sensitive junction thermally actuatable to intrinsically

switch between high and low resistance states in response to a predetermined temperature of said power switching junction



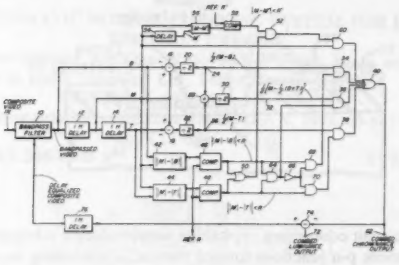
sensed through said substrate, said predetermined temperature being less than the thermal breakover temperature of said power switching junction.

4,050,084

COMB FILTER FOR TELEVISION SIGNALS HAVING ADAPTIVE FEATURES

John P. Rossi, New York, N.Y., assignor to CBS Inc., New York, N.Y.

Filed July 14, 1976, Ser. No. 705,204
Int. Cl.² H04N 9/535
U.S. Cl. 358—31 **7 Claims**



1. An adaptive comb filter system for separating the luminance and chrominance components of an input composite NTSC television information signal, comprising, in combination:

bandpass filter means connected to receive said input composite television signal and operative to pass a band of frequencies including the chrominance components and high frequency luminance components of the signal,

means for separating the bandpassed video signal into a main (M) line component and adjacent top (T) and bottom (B) line components,

an output terminal,

means for deriving from said main line component (M) and said adjacent line components (B) and (T) four possible choices for the chrominance component of said television signal to be coupled to said output terminal, said choices being $\frac{1}{2}[M - \frac{1}{2}(B+T)]$, $\frac{1}{2}(M-B)$, $\frac{1}{2}(M-T)$, or M, and

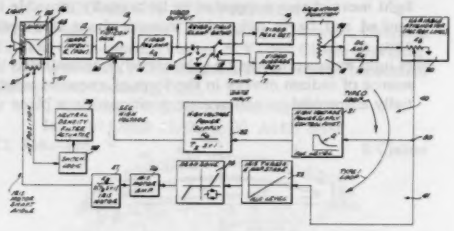
logic means operative in response to luminance or chrominance transitions in the vertical direction in the bandpassed video signal for coupling to said output terminal as the chrominance output the one of said four choices, or no chrominance signal, that most minimizes transient distortions in the television picture reconstructed from said television signal.

4,050,085

AUTOMATIC LIGHT CONTROL SYSTEM

Paul R. Prince; Bernard J. Skehan, both of Manhattan Beach, and Jay M. Hansen, Santa Monica, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed June 4, 1969, Ser. No. 830,589
Int. Cl.² H04N 5/38
U.S. Cl. 358—219 **19 Claims**



1. An electro-optical system comprising:

a. a lens system having an iris diaphragm,

b. a television camera to convert light energy to video output signals,

c. said television camera further comprising a non-linear gain determining element,

d. a first feedback loop responsive to said video output signals to stably control said gain determining element to provide optimum operation below overloading of said camera said first loop including a compensating circuit having a non linearity substantially inverse to said non-linear gain of said non-linear gain determining element,

e. a second feedback loop responsive to said video output signals to adjust said iris diaphragm to admit an amount of light energy for optimum video output signals below overloading of said camera, and,

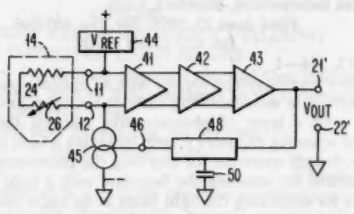
f. a dead zone circuit to inhibit actuation of said second feedback loop from adjusting said iris diaphragm until the energy in said video output signals changes a predetermined increment above or below a level of energy set for said optimum operation below overloading of said camera.

4,050,086

DYNAMIC TRANSDUCER BIASING SIGNAL AMPLIFYING CIRCUITRY

Jerome Danforth Harr, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 6, 1976, Ser. No. 684,053
Int. Cl.² G11B 5/02
U.S. Cl. 360—66 **14 Claims**



1. Dynamic transducer biasing signal amplifying circuitry for translating a signal generated in an electromagnetic transducer having two terminals across which direct biasing current is applied and a unidirectional output voltage having a component of offset voltage and a component of varying output voltage signal is delivered, comprising

a pair of input terminals between which said electromagnetic transducer is connected,

differential translating circuitry having input terminals individually connected to said pair of input terminals and having output terminals at which an output voltage proportional to said varying output voltage signal is delivered,

said translating circuitry being arranged for developing internally thereof an offset voltage substantially equal to said offset voltage of said transducer and

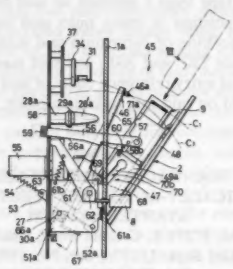
control circuitry having an input circuit connected between one of said output terminals and a point of fixed reference potential and having an output circuit connected to said input terminals for developing a direct voltage proportional to said output voltage for biasing said electromagnetic transducer.

4,050,087

CASSETTE TAPE RECORDING AND/OR REPRODUCING APPARATUS

Yoshio Kishi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 9, 1976, Ser. No. 712,770
Claims priority, application Japan, Aug. 13, 1975, 50-98289
Int. Cl.[2] G11B *23/06*
U.S. Cl. 360—96 **16 Claims**



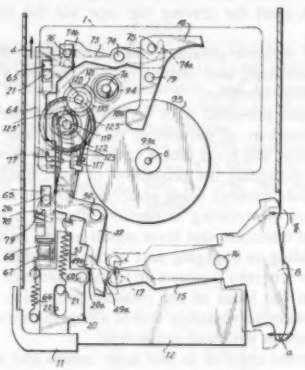
1. A tape recording and/or reproducing apparatus for use with a tape cassette including a housing containing a supply of tape and having spaced parallel walls with an opening therebetween at one side of the housing along which a run of the tape is normally guided, and at least one lid mounted on the housing for movement relative to the latter parallel to the planes of said spaced walls between a closed position where the lid extends along the opening for covering a respective part of said run of the tape and an opened position where the lid is displaced from said opening in the direction away from said one side of the housing to permit the withdrawal of the tape through said opening: said apparatus comprising a chassis; transducer means mounted on said chassic for recording and/or reproducing information signals on a tape engaged therewith; locating means on said chassis engageable with the cassette housing for disposing the latter with said one side thereof facing toward and spaced from said transducer means; tape withdrawing means engageable with said tape run in a cassette housing engaged with said locating means and being operative to withdraw th tape through said opening and into engagement with said transducer means; and a cassette loading device including a cassette holder, means mounting said holder for movement in respect to said chassis between an inoperative position spaced from said locating means for the insertion and removal of a cassette is said holder and an operative position where a cassette in said holder is engaged with said locating means, lid opening means mounted for movement in respect to said holder between an inactive position at which said lid opening means is spaced from said holder in a direction substantially perpendicular to said planes of the walls of a cassette housing in said holder at said inoperative position so as to avoid interference with said insertion and removal of the cassette therein, and an active position at which said lid opening means is engageable with each said lid of a cassette in said holder at said operative position and is displaced relative to said holder in the direction of movement of the respective lid from its closed position to its opened position, and mechanical coupling means connecting said holder and said lid opening means for disposing the latter in said inactive and active positions in response to the movement of said holder to said inoperative and operative positions, respectively.

4,050,088

APPARATUS FOR SELECTING PLAYBACK OR RECORDING MODES IN MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

Hiroshi Okuda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 6, 1975, Ser. No. 629,676
Claims priority, application Japan, Nov. 7, 1974, 49-128385
Int. Cl.[2] G11B *15/02*
U.S. Cl. 360—96 **17 Claims**



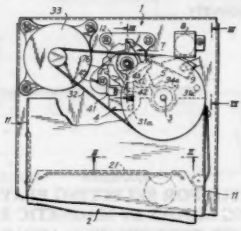
1. A magnetic tape recording and/or reproducing apparatus comprising: a chassis; a head base having magnetic head means thereon for selectively recording and reproducing signals on a tape; means mounting said head base on the chassis for movement relative to the latter between an inactive position, in which said head means is spaced from the tape, and an active position, in which said head means is engageable with the tape; a first mode selecting member selectively manually actuable to a rest position for establishing a stop mode of the apparatus and to an operative position for moving said head base to said active position of the latter; a second mode selecting member manually actuable from a rest position to an operative position; interconnecting means responsive only to actuation of said second mode selecting member to said operative position of the latter for displacing said first mode selecting member from said rest position to said operative position of said first mode selecting member; and mode change-over means for establishing a reproducing mode of the apparatus in response to the actuation of said first mode selecting member to said operative position thereof with said second mode selecting member in said rest position of the latter and for changing-over the apparatus to a recording mode thereof in response to actuation of said second mode selecting member to said operative position of the latter.

4,050,089

APPARATUS FOR SHIFTING THE MAGNETIC TAPE HEAD IN A MULTITRACK TAPE PLAYER

Kenzi Okamoto, Kobe, Japan, assignor to Fujitsu Ten Limited, Kobe, Japan

Filed Oct. 14, 1975, Ser. No. 621,807
Claims priority, application Japan, Oct. 30, 1974, 49-124242
Int. Cl.[2] G11B *21/08, 5/55*
U.S. Cl. 360—106 **7 Claims**



1. Cartridge type tape player apparatus having a tape deck, a replaceable cartridge accommodating a multitrack magnetic tape, tape driving meanns and a magnetic tape head, said apparatus comprising

head shift means for shifting a magnetic tape head between specific tracks on a multitrack magnetic tape;

a capstan shaft for driving the tape via the tape driving means;

a capstan member affixed to the capstan shaft for rotation with said shaft, said capstan member having a projection extending therefrom;

lever means provided on a vertical axis on the tape deck with freedom of movement in vertical and horizontal directions, said lever means having a guide member selectively engageing the projection of the capstan member, said guide member being positioned so that it crosses the locus of the rotating projection when it is driven in a vertical direction, said lever means having an end portion for guiding an engaging part of the head shift means in a manner whereby it rotates up to the position of the projection on the locus of the rotating projection when said guide member rotatably moves along the vertical axis in cooperation with said projection;

spring means coupled to said lever means and maintaining said lever means in the rest position; and

operating means mounted on he tape deck for transferring the operation in the vertical direction to said lever means in response to the detection of an indication on the tape thereby shifting said lever means from a rest position to an operating position againt the action of said spring means.

4,050,090

HELICAL SCAN MAGNETIC RECORDING DEVICE HAVING A FOLDED MOUNTING PLATE

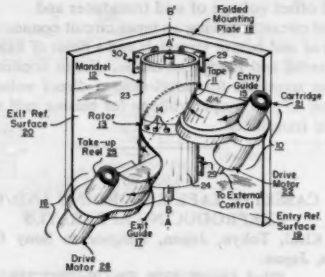
Ernest P. Kollar, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 16, 1975, Ser. No. 613,753
Int. Cl.[2] G11B *5/52, 5/78, 19/00*
U.S. Cl. 360—130 **7 Claims**

1. In a helical scan magnetic recording device of the type comprising a source of magnetic tape, a mandrel having a cylinder axis for supporting a wrap of said tape about a portion of its periphery; entry guide means for guiding said tape from said tape source onto said mandrel, a rotor for carrying about said cylinder axis at least one magnetic head in scanning adjacency to said tape along a path which is slanted with respect to said tape, a tape sink for receiving tape from said mandrel, exit guide means for guiding said tape off said mandrel and into said tape sink; and mounting means for mounting said mandrel, entry guide means, and exit guide means in operative relationship, the improvement wherein:

said mounting means comprises a folded reference mounting plate having a substantially planar entry reference surface and also having a substantially planar exit reference surface which is non-parallel to said entry reference surface;

said entry guide means is mounted on said entry reference plane of said folded reference mounting plate;



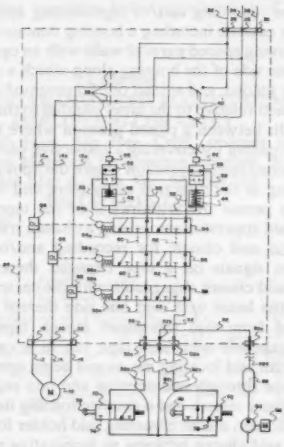
said exit guide means is mounted on said exit reference plane of said folded reference mounting plate at a position for removing tape from a position on said mandrel displaced from the position of entry onto said mandrel displaced from the position of entry onto said mandrel by an angle intermediate 180° and 360°; and said mandrel is mounted on both said entry reference plane of said folded mounting surface and on said exit reference plane.

4,050,091

MANUALLY-CONTROLLED PNEUMATICALLY-ACTUATED ELECTRIC MOTOR STARTER SYSTEM

John H. Goettel, 27279 S. Gribble Road, Canby, Oreg. 97013

Filed Sept. 2, 1976, Ser. No. 719,961
Int. Cl.[2] H02H *7/085*
U.S. Cl. 361—31 **6 Claims**



1. A manually-controlled, pneumatically actuated electric motor starter and overload protection system comprising:

a. an electric motor;

b. multiple electrical conduits connected to said motor for supplying electrical current thereto;

c. multiple electrical switch means, each interposed in a respective one of said electrical conduits, for selectively

permitting or interrupting the flow of said current therethrough;

d. pneumatic actuating means connected to said multiple switch means for moving said multiple switch means in unison to positions permitting the flow of said current through said multiple conduits in response to the exposure of said pneumatic actuating means to a gas charge at a pressure above a predetermined pressure level;

e. biasing means associated with said pneumatic actuating means and said multiple switch means for moving said multiple switch means in unison to positions interrupting the flow of said current through said multiple conduits in response to the reduction of the pressure of said gas charge to below said predetermined pressure level;

f. motor-driven gas compressor means for supplying said gas charge at a pressure above said predetermined pressure level to said pneumatic actuating means;

g. gas conduit means for conveying said gas charge from said compressor means to said pneumatic actuating means;

h. multiple overload sensing means, each interposed in a respective one of said multiple electrical conduits, for sensing the presence of a current flow in any one of said electrical conduits greater than a predetermined current flow;

i. multiple pneumatic overload valve means interposed in series in said gas conduit means between said pneumatic actuating means and said compressor means, each of said pneumatic overload valve means being connected to a respective one of said overload sensing means, for selectively permitting the exposure of said pneumatic actuating means to said gas charge at said pressure above said predetermined pressure level in response to the electrical current flow in each of said electrical conduits, as sensed by said multiple overload sensing means, being below said predetermined current flow, or for selectively reducing the pressure of said gas charge to below said predetermined pressure level in response to the electrical current flow in any one of said electrical conduits, as sensed by any one of said overload sensing means, being greater than said predetermined current flow; and

j. manually-operable pneumatic valve means interposed in said gas conduit means between said pneumatic actuating means and said compressor means and in series with said multiple overload valve means for selectively permitting the exposure of said pneumatic actuating means to said gas charge at said pressure above said predetermined pressure level or reducing the pressure of said gas charge to below said predetermined pressure level, the portion of said gas conduit means between said manually-operable pneumatic valve means and said pneumatic actuating means being electrically nonconductive.

4,050,092

MULTI-CIRCUIT PROTECTOR

Frank L. Simokat, Babylon, N.Y., assignor to TII Corporation, Lindenhurst, N.Y.

Filed Aug. 20, 1976, Ser. No. 716,196
Int. Cl.[2] H02H 9/06
U.S. Cl. 361—56 **5 Claims**

1. A multi-circuit overvoltage protector for concurrently protecting both the power and signal circuits of equipment comprising a portable, plug-in unit:

a. configured to be manually inserted in a pre-existing power outlet and having:

b. plug means for making electrical contact with the contacts of said outlet;

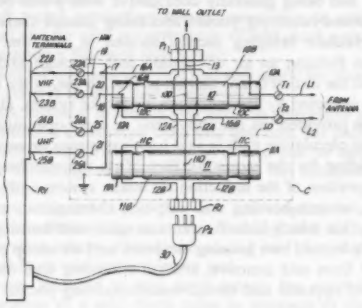
c. receptacle means adapted to receive a power plug connected to said power circuits of said equipment;

d. a power circuit interconnecting said plug means and receptacle means and having a ground line;

e. a first gas filled arrester connected across said power circuit and including a connection to said ground line;

f. signal input connector means for receiving the output of a signal circuit;

g. signal output connector means for supplying said signal circuit of said equipment;



h. a signal coupling circuit interconnecting said signal input and signal output connectors; and

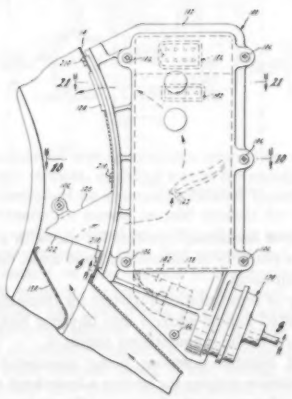
i. a second gas filled arrester connected across said signal coupling circuit and including a connection to said ground line of said power circuit.

4,050,093

HOUSING FOR MOUNTING ELECTRONIC CIRCUIT BOARDS ON AN ENGINE AIR INTAKE STRUCTURE

Frederick William Crall, Farmington, and Lawrence William Tomczak, Sterling Heights, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 587,193, June 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 570,540, April 22, 1975, abandoned. This application Feb. 19, 1976, Ser. No. 659,297
Int. Cl.[2] H05K 7/20
U.S. Cl. 361—383 **3 Claims**



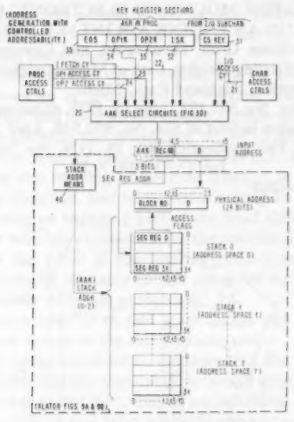
1. An assembly adapted for mounting electronic circuitry on a portion of the induction air intake system of an internal combustion engine, said assembly comprising: an electronic circuit board housing defined by two housing elements and containing interiorly thereof a generally rectangular circuit-board-receiving pocket containing an electronic circuit board disposed therein; said housing having a concave, arcuate mounting wall defined jointly by said two housing elements thereof, said concave, arcuate mounting wall being adapted to be disposed against a matching convex portion of a wall of the induction air intake system over one or more openings pro-

vided therein; said concave, arcuate housing wall including one or more openings for communication with the one or more openings in the wall portion of the induction air intake system; that portion of said concave, arcuate mounting wall which is defined by one of said two housing elements extending arcuately and being generally coextensive with a side of said circuit-board-receiving pocket and being jointed thereto by an intermediate bridging section formed in said one element; means forming an air circulation path through said housing across the circuit board therein so that, in use, when induction air is inducted by the induction air intake system, air circulation is provided via the above one or more openings through the air circulation path in said housing; means on said housing providing for the mounting thereof on the matching convex wall portion of the induction air intake system with said concave, arcuate housing wall disposed thereagainst; and an air scoop via which induction air can enter said housing defined jointly by said two housing elements, said air scoop projecting away from said concave, arcuate mounting wall on the side thereof opposite said circuit-board-receiving pocket.

4,050,094
TRANSLATOR LOOKAHEAD CONTROLS

Donall Garraid Bourke, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,227
Int. Cl.[2] G06F *9/20*
U.S. Cl. 364—200 **6 Claims**



1. Translator lookahead controls for use with a main memory having a plurality of different storage units, the lookahead controls comprising,

a plurality of segmentation registers for translating a part of an inputted logical address into physical block addresses contained in the segmentation registers,

lookahead bistable positions being associated with each segmentation register for storing a lookahead coded signal for identifying a particular one of the storage units which contains a block being addressed by a loaded content of the segmentation register,

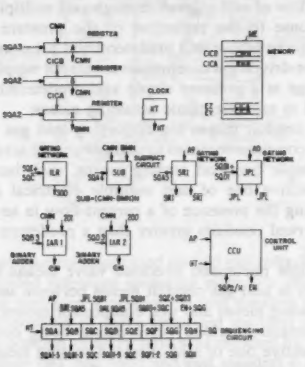
means for selecting one of the segmentation registers to be loaded with an inputted physical block address, the lookahead bistable positions associated with each segmentation register being selected when the associated segmentation register is selected,

means for generating the lookahead coded signal from the inputted physical block address being loaded into a selected segmentation register, and means for setting the coded signal into the selected lookahead bistable positions.

4,050,095
CALL LOAD SHARING SYSTEM BETWEEN A PLURALITY OF DATA PROCESSING UNITS

Rodney Pettipher, Paris; Lucien Nicolas Leon Viellevoye, Ris-Orangis, and Albert Kruithof, Ville D'Avray, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 367,857, June 7, 1973, abandoned. This application Mar. 1, 1976, Ser. No. 662,670
Int. Cl.[2] G06F *15/16*
U.S. Cl. 364—200 **2 Claims**



1. A call load sharing apparatus for a communications system in which said apparatus processes the completion of calls through the system, said apparatus including a first processor for processing a first plurality of calls through said system and a second processor for processing through said system calls other than said first plurality of calls, said apparatus including a first memory for storing a predetermined first number indicative of the calls which are to be processed through said system, a second memory for storing a lesser number, the lesser number representing the number of said first plurality of calls to be processed by said first processor, scanning means receptive of calls from the system for initiating the processing of calls by said first processor, a first counter responsive to all calls received by the scanning means for producing a first count representing a total of the calls received for processing, a second counter responsive to calls being processed by said first processor for producing a second count, a comparator for comparing the second count against the number stored in said second memory, said second comparator responsive to an equality between said second count and the second number for producing an output signal, and a control unit responsive to the output signal for causing subsequent calls received by said scanning means to be processed by said second processor.

4,050,096
PULSE EXPANDING SYSTEM FOR MICROPROCESSOR SYSTEMS WITH SLOW MEMORY

Thomas H. Bennett, Scottsdale, and Michael F. Wiles, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 519,135, Oct. 30, 1974, abandoned. This application June 7, 1976, Ser. No. 693,465
Int. Cl.[2] G06F *1/04*
U.S. Cl. 364—200 **3 Claims**

1. A microprocessor system comprising:

a clock signal source for producing a clock signal including a sequence of periodic clock pulses;

data bus means for transferring data in said microprocessor system;

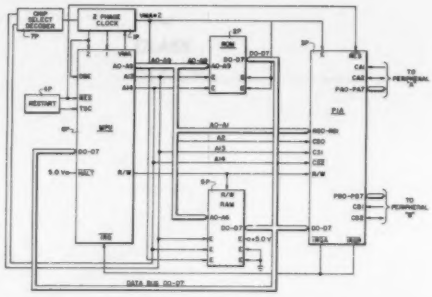
microprocessor means responsive to said clock signal and coupled to said data bus means for executing program instructions in said microprocessor system;

memory means responsive to said clock signal coupled to

said data bus means for storing digital information and for storing said program instructions, said memory means including at least one slow access location having associated therewith a slower access time than other locations of said memory means;

said memory means having an address input for effecting addressing of said slow access location;

said microprocessor means incuding address means coupled to said memory means to effect addressing of said memory means;



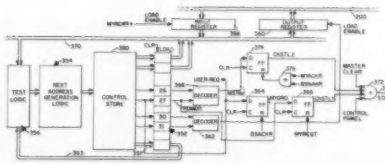
said clock signal source including circuit means responsive to said address input for increasing the duration of only one of said pulses of said clock signal by a first predetermined amount of time when said slow access location means is addressed, said first predetermined amount of time being such that the elapsed time between the time at which said location of said memory means is addressed and the time at which the trailing edge of said one of said pulses occurs exceeds by a second predetermined amount of time the minimum access time of said location of said memory means.

4,050,097

SYNCHRONIZATION TECHNIQUE FOR DATA TRANSFERS OVER AN ASYNCHRONOUS COMMON BUS NETWORK COUPLING DATA PROCESSING APPARATUS

Ming T. Miu, Chelmsford; Virendra S. Negi, Pepperell, and Richard A. Lemay, Bolton, all of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Sept. 27, 1976, Ser. No. 727,194
Int. Cl.[2] G06F *1/04*
U.S. Cl. 364—200 **12 Claims**



1. Data transfer apparatus comprising:

A. clock means, having a control input and an output, for providing a stream of clock pulses at said output, said clock means including means for inhibiting the generation of said clock pulses in response to the presence of a stall signal at said control input at a time when one of said clock pulses should have occurred, said stall signal having no effect on the generation of said clock pulses if said stall signal is received after the occurrence of a said clock pulse and is no longer present at a time when a next one of said clock pulses should normally be generated;

B. a plurality of units, including a first unit and a second unit, said clock means included in said first unit;

C. a common electrical bus coupled with each of said units for enabling the transfer of information between said units;

D. means, included in said first unit, for generating a first signal indicating a request for the use of said bus;

E. means for generating a second signal indicating the granting to said first unit of the use of said bus;

F. means, included in said first unit and responsive to said second signal, for transferring information over said bus to said second unit;

G. stall signal generating means, responsive to said first signal and the next occurring one of said clock pulses, for generating a first said stall signal;

H. means for coupling said first said stall signal for receipt by said control input of said clock means;

I. means, included in said second unit and responsive to said information transferred from said first unit, for providing a positive acknowledgement over said bus to said first unit, indicating that said second unit has accepted said information;

J. means, included in said first unit and responsive to said positive acknowledgement, for disabling said stall signal generating means, thereby removing said first said stall signal from said control input; and

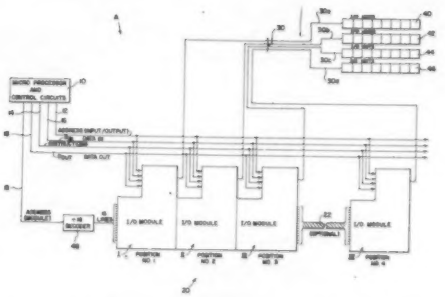
K. means, included in said clock means, for enabling the generation of a said clock pulse in response to the said removal of a said stall signal from said control input.

4,050,098

SELF-ADDRESSING MODULES FOR PROGRAMMABLE CONTROLLER

William H. Seipp, Bettendorf, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,257
Int. Cl.[2] G06F *9/00*
U.S. Cl. 364—900 **6 Claims**



1. In a module for a programmable controller, said module including logic circuits, enabling means for enabling said circuits upon receipt of an externally created module enabling signal, and conductor means on said module for conducting said module enabling signal to said enabling means, the improvement comprising: at least first, second and third input terminals arranged on said module in a preselected pattern having a first position, second position and third position; at least first, second and third output terminals arranged in said preselected pattern; said first input terminal being in said first position and electrically connected to said conductor means; said second input terminal being in said second position and connected to said first output terminal in said first position of said pattern; said third input terminal being in said third position and connected to said second output terminal in said second position of said pattern; said third output terminal being electrically isolated from said input terminals; and means for connecting said first, second and third input terminals to external first, second and third conductors, respectively, and an external decoding means for directing said module enabling signal to said first of said conductors only when said module is to be enabled and said decoding means directing said module enabling signal to said second and third conductors when said first and second output terminals, respectively, are to receive said module enabling signal.

DESIGN PATENTS

GRANTED SEPTEMBER 20, 1977

ERRATA

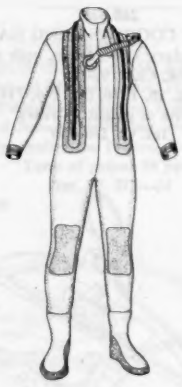
For CLASS	See PATENT NO.
014–059	245,871

DESIGNS

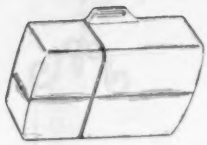
SEPTEMBER 20, 1977

245,816
MOTORCYCLIST'S SAFETY BELT
Sam Conti, 140 N. 33rd St., and Salvatore J. Catania, 113 N. 40th St., both of Omaha, Nebr. 68131
Filed Sept. 15, 1975, Ser. No. 613,532
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—380

245,817
DRY SUIT
Charles R. Smalley, Los Angeles, Calif., assignor to Warnaco, Inc.
Filed Sept. 2, 1975, Ser. No. 609,576
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—29



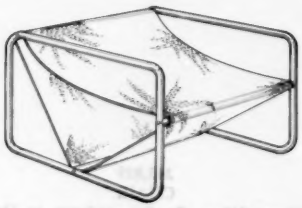
245,818
BELT ATTACHABLE WATERTIGHT CONTAINER
Björn Olof Hjalmar Persson, Bergsgatan 21 B, S-832 00 Froson, Sweden
Filed Apr. 30, 1975, Ser. No. 573,002
Claims priority, application Sweden, Oct. 31, 1974, 741791
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



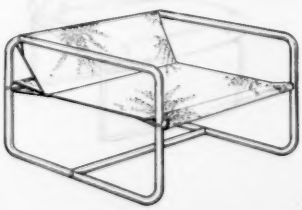
245,819
CHAIR
Robert Tillberg, Viken, Sweden, assignor to Overman AB, Tranas, Sweden
Filed Oct. 30, 1975, Ser. No. 627,133
Claims priority, application Sweden, May 6, 1975, 75974
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

245,820
MISSAL STAND
Joseph W. Matthews, 1700 S. Glendon Drive, Melbourne, Fla. 32901
Filed Oct. 20, 1975, Ser. No. 623,724
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—29

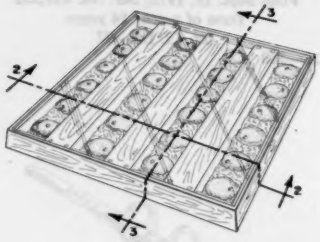
245,821
SEAT OR SIMILAR ARTICLE
Peter D. Piper, and Kent W. Bouldin, both of Dallas, Tex., assignors to Peter Piper Plastics, Inc., Dallas, Tex.
Filed Oct. 22, 1975, Ser. No. 624,649
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



245,822
SEAT OR SIMILAR ARTICLE
Peter D. Piper, and Kent W. Bouldin, both of Dallas, Tex., assignors to Peter Piper Plastics, Inc., Dallas, Tex.
Filed Oct. 22, 1975, Ser. No. 624,651
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



245,823
TABLE TOP
Robert Fields, 229 W. Illinois St., Chicago, Ill. 60610
Filed Mar. 12, 1976, Ser. No. 666,394
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192



245,824
DOOR PANEL
James J. Palka, 1522 E. Peachtree Drive, Arlington Heights, Ill. 60004
Filed May 14, 1976, Ser. No. 686,678
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—193

245,825
GARMENT COORDINATING HANGER
Joel F. Lemke, and Mary Lou Lemke, both of 2625 Rainbow Glen Road, Fallbrook, Calif. 92028
Filed Aug. 16, 1976, Ser. No. 714,688
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—256

245,826

DINNER PLATE OR SIMILAR ARTICLE

James W. Luce, Syracuse, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 399,998, Sept. 24, 1973, abandoned. This application Sept. 11, 1975, Ser. No. 612,347

Term of patent 14 years

Int. Cl. D7—*01*

U.S. Cl. D7—25

245,827

HAMBURG PATTY PRESS

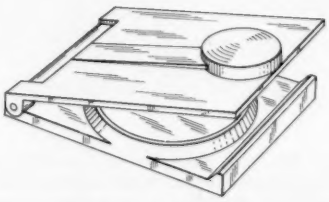
Reuben F. Korpi, Rte. 2 Box 132, Peterborough, N.H. 03458

Filed Sept. 4, 1975, Ser. No. 610,134

Term of patent 14 years

Int. Cl. D7—*02*

U.S. Cl. D7—43



245,828

GAS BURNER OR SIMILAR ARTICLE

Claude Alain Richard Monnet, Paris, France, assignor to Shell International Petroleum Company Limited, London, England

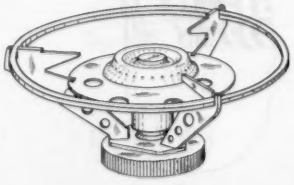
Filed June 18, 1975, Ser. No. 587,879

Claims priority, application France, Dec. 19, 1974, 74.73454

Term of patent 14 years

Int. Cl. D7—*04*

U.S. Cl. D7—136



245,829

HELICAL SPRING RETRACTING TOOL

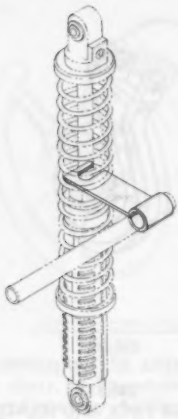
Arnold Cowan, 5530 Yarmouth Ave., Apt. 112, Encino, Calif. 91316

Filed May 20, 1976, Ser. No. 688,310

Term of patent 14 years

Int. Cl. D8—*05*

U.S. Cl. D8—16



245,830

BOTTLE-OPENER

François de Gross, Geneva, Switzerland, assignor to François de Gross & Cie., Carouge, Switzerland

Filed Jan. 20, 1976, Ser. No. 650,661

Claims priority, application Switzerland, July 21, 1975, 61365/75

Term of patent 14 years

Int. Cl. D7—*99*

U.S. Cl. D8—18

245,831

SCORING KNIFE BLADE

Robert F. West, Simsbury, and Mark Alan Drechsler, Southington, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed July 1, 1976, Ser. No. 701,853

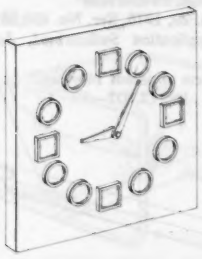
Term of patent 14 years

Int. Cl. D8—*03*

U.S. Cl. D8—20

245,832
LOAD HOOK
Lars Fredriksson, Vaxjo, Sweden, assignor to K.A. Bergs Smide AB, Gemla, Sweden
Filed Aug. 1, 1975, Ser. No. 601,312
Claims priority, application Sweden, Jan. 31, 1975, 75214
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

245,833
COMBINED CLOCK FACE AND HANDS THEREFOR
Patricia K. Dystant, 23256 Ithaca St., Oak Park, Mich. 48237
Filed Apr. 11, 1974, Ser. No. 459,944
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125

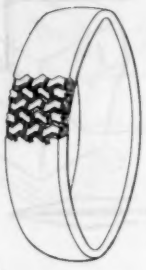


245,834
BRACELET
James T. Wilbert, SRA Box 1568-K, Anchorage, Alaska 99507
Filed Jan. 19, 1976, Ser. No. 650,492
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—7

245,835
STATUETTE WITH HANGING STRING
Leon D. Lusk; Dorinda J. Lusk, both of 1610 Quail Drive, Greensboro, N.C. 27048, and Bobby E. Smith, 1208 Rhue Road, Winston-Salem, N.C. 27107
Filed Jan. 26, 1976, Ser. No. 652,623
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131

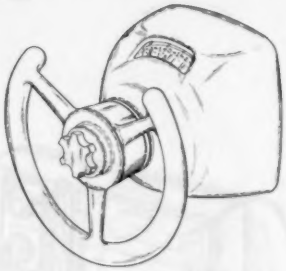
245,836
PNEUMATIC TIRE TREAD AND BUTTRESS
Gernot Arendt, Tribuswinkel, Austria, assignor to Deutsche Semperit Gummiwerk Ges. m.b.H., Munich, Germany
Filed Dec. 15, 1975, Ser. No. 640,942
Claims priority, application Germany, June 20, 1975, 10353
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143

245,837
PNEUMATIC TIRE TREAD AND BUTTRESS
Gernot Arendt, Tribuswinkel, Austria, assignor to Deutsche Semperit Gummiwerk Ges. m.b.H., Munich, Germany
Filed Dec. 15, 1975, Ser. No. 640,878
Claims priority, application Germany, June 20, 1975, 10354
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—151



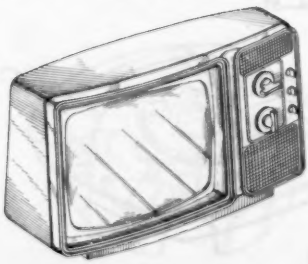
245,838
MOTORCYCLE CAB
Buck D. Messinger, 6001 SW. 3rd St., Des Moines, Iowa 50315
Filed July 21, 1975, Ser. No. 597,580
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—156

245,839
SHIP'S HELM
William T. Spurgin, Charlottesville, Va., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Oct. 12, 1976, Ser. No. 731,231
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—176

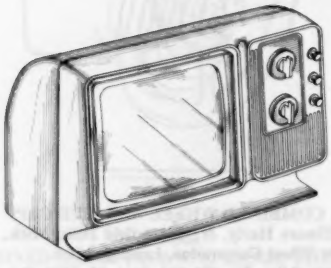


245,840
COMBINED WHEEL AND HUB CAP
Millard Fillmore Harty, Jr., Bloomfield Hills, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Division of Ser. No. 291,304, Sept. 22, 1972, Pat. No. Des. 239,267.
This application Mar. 15, 1976, Ser. No. 666,593
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

245,841
TELEVISION RECEIVER
Melvin H. Boldt, Glenview, and Richard K. Althans, Long Grove, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.
Filed Mar. 15, 1976, Ser. No. 666,711
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D14—80

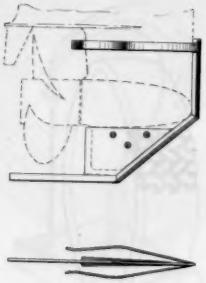


245,842
TELEVISION RECEIVER
Melvin H. Boldt, Glenview, and William M. Casnovsky, Palatine, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.
Filed Feb. 12, 1976, Ser. No. 657,501
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D14—80

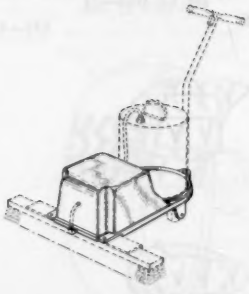


245,843
TELEPHONE
Isamu Hirasawa, Tokyo; Minoru Sasai, Atsugi, and Kunio Ito, Chigasaki, all of Japan, assignors to Kanda Tsushin Kogyo Co., Ltd., Tokyo, Japan
Filed Dec. 7, 1976, Ser. No. 748,394
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—57

245,844
LOWER UNIT GUARD FOR MARINE OUTBOARD MOTOR AND STERN DRIVE
Daryl J. Donat, Pasco, Wash., assignor to Jack C. Bramlette, Pasco, Wash., a part interest
Filed May 20, 1976, Ser. No. 688,483
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—4



245,845
WAX APPLICATOR HOUSING
Robert C. Deuchar, 209 Bayview Drive, San Carlos, Calif. 94070, and Gene J. Waitzman, 1055 Avondale St., San Jose, Calif. 95129
Filed Dec. 4, 1975, Ser. No. 637,752
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—48

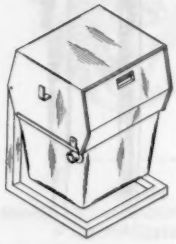


245,846

COIN OPERATED VACUUM OR SIMILAR ARTICLE

Richard W. Livingston, 10100 Raytown Road, Kansas City, Mo. 64134

Filed May 10, 1976, Ser. No. 684,784
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—52

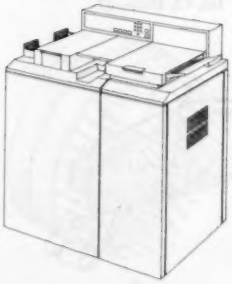


245,847

ELECTROPHOTOGRAPHIC COPIER OR THE LIKE

Ernest Michael Bevilacqua, Wilton; Allen Dana Hawthorne, and Eliot Fette Noyes, both of New Canaan, all of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1975, Ser. No. 637,484
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30

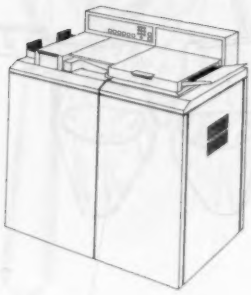


245,848

ELECTROPHOTOGRAPHIC COPIER OR THE LIKE

Ernest Michael Bevilacqua, Wilton; Allen Dana Hawthorne, and Eliot Fette Noyes, both of New Canaan, all of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1975, Ser. No. 637,486
Term of patent 14 years
Int. Cl. D16—*3*
U.S. Cl. D16—30

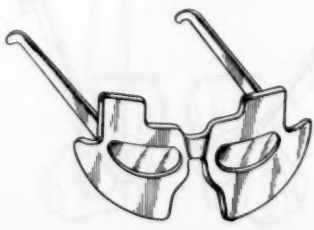


245,849

EYEGLASSES

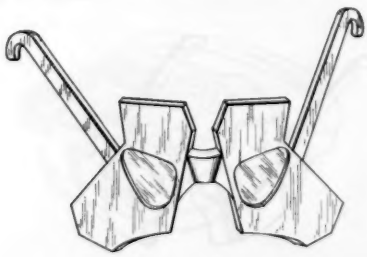
Lloyd A. Strickland, 2511 Kensington Ave., Richmond, Va. 23220

Filed Aug. 13, 1975, Ser. No. 604,456
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—71



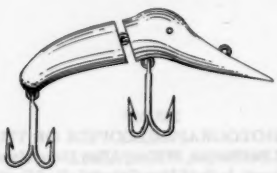
245,850
EYEGLASSES
Lloyd A. Strickland, 2511 Kensington Ave., Richmond, Va. 23220
Filed Aug. 13, 1975, Ser. No. 604,472
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—71

245,851
EYEGLASSES
Lloyd A. Strickland, 2511 Kensington Ave., Richmond, Va. 23220
Filed Aug. 13, 1975, Ser. No. 604,475
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—71

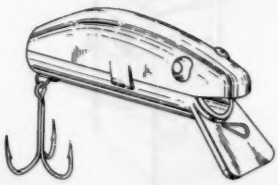


245,852
BALL-POINT PEN
Alain Carre, Paris, France, assignor to Waternab S.A., Paris, France
Filed Oct. 9, 1975, Ser. No. 621,042
Claims priority, application France, Apr. 10, 1975, 75.73777
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—45

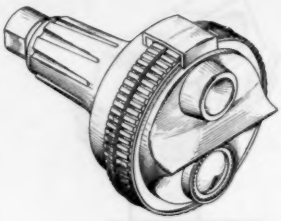
245,853
FISHING LURE
William DeWar, P.O. Box 313, Monte Rio, Calif. 95462
Filed Jan. 4, 1977, Ser. No. 756,731
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



245,854
FISHING LURE
James T. Sullivan, 4436 St. John, Kansas City, Mo. 64123
Filed Feb. 22, 1977, Ser. No. 770,918
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

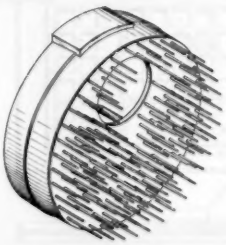


245,855
SHOWERHEAD
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Nov. 15, 1976, Ser. No. 742,207
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

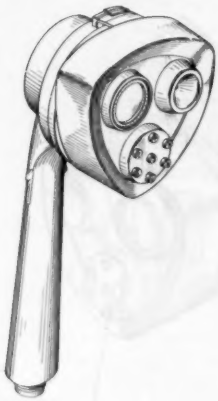


245,856
BODY MASSAGE ATTACHMENT FOR A HANDHELD SHOWERHEAD
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Oct. 18, 1976, Ser. No. 733,076
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

245,857
SCALP MASSAGE ATTACHMENT FOR A HANDHELD SHOWERHEAD
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Oct. 18, 1976, Ser. No. 733,077
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

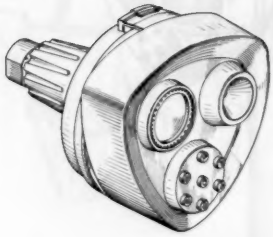


245,858
HANDHELD SHOWERHEAD
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Nov. 15, 1976, Ser. No. 742,205
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



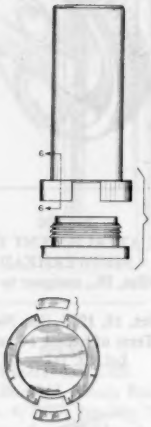
245,859
HANDHELD SHOWERHEAD
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Nov. 15, 1976, Ser. No. 742,206
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

245,860
SHOWERHEAD
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Nov. 15, 1976, Ser. No. 742,208
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



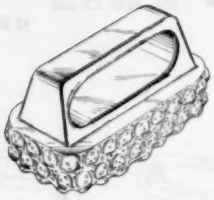
245,861
BABY BATH SEAT
Robert Elder, Altadena, Calif., assignor to Joseph Baker, Glendale, Calif.
Filed July 15, 1976, Ser. No. 705,451
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—52

245,862
CONTAINER FOR SOLID VAPORIZER
Andrew C. Bulloch, 13545 Heartside Place, Dallas, Tex. 75234, and Ronald R. Rolen, 2706 Arcady Drive, Garland, Tex. 75041
Filed Feb. 19, 1976, Ser. No. 659,547
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

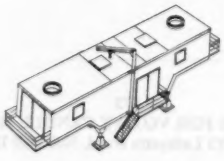


245,863
OPHTHALMIC INSTRUMENT CONTROL BOARD
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 5, 1976, Ser. No. 655,332
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1.1

245,864
ROLLING MASSAGE UNIT
Rywka Luba Gelbart, 1745 E. 16th St., Brooklyn, N.Y. 11229
Filed Nov. 28, 1975, Ser. No. 635,573
Term of patent 14 years
Int. Cl. D28—*03;* D24—*99*
U.S. Cl. D24—36



245,865
CRUSHING PLANT
Lars Sture Bostrom, Umea, Sweden, assignor to Aktiebolaget Robacks Mekaniska, Umea, Sweden
Filed Apr. 28, 1976, Ser. No. 681,271
Claims priority, application Sweden, Oct. 30, 1975, 75898
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—3



245,866
KIOSK
John Schuldenfrei, 67 Highfield Gardens, London N.W. 11, and Raymond Saadiah Turner, 2 Hartfield Avenue, Elstree, Hertfordshire, both of England
Filed Apr. 16, 1976, Ser. No. 677,733
Claims priority, application United Kingdom, Feb. 24, 1976, 974617/76
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—10

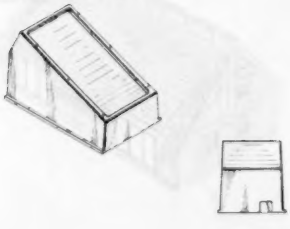
245,867
BUILDING
Eliud W. Holland, 13205 Old Cutler Road, Miami, Fla. 33156
Filed July 19, 1976, Ser. No. 706,288
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—23

245,868
COMBINED FOLDABLE AND TRANSPORTABLE HOME
Keith O. Burton, P.O. Box 626, White Pigeon, Mich. 49099
Filed Aug. 20, 1975, Ser. No. 606,084
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—30

245,869
SHEET PILE
Akemasa Otani, 2 Green Mansion, 7-6-50 Akasaka, Minato, Tokyo, Japan
Filed Aug. 16, 1974, Ser. No. 497,932
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75

245,870
FENCE POST TOP
Duayne D. Dougherty, 6807 N. 39th Ave., Phoenix, Ariz. 85015
Filed July 29, 1976, Ser. No. 709,594
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—77

245,871
TELEPHONE COMMUNICATIONS MODULE
Maurice I. Smith, Woodinville, Wash., assignor to Tone Commander Systems, Inc.
Filed Aug. 6, 1976, Ser. No. 712,245
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59



245,872
ICE SKATE
Hugh E. Baikie, 1115 Sherbrooke St. W., Montreal, Quebec, Canada (H3A 1H3), and Peter Willy Schaack, 2380 Laurentien Boulevard, Ville St-Laurent P.Q., Canada
Filed Jan. 19, 1976, Ser. No. 649,926
Claims priority, application Canada, Oct. 17, 1975, 17-10-75-6
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 B

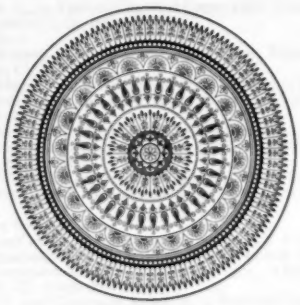
245,873
WALL SCONCE FOR VOTIVE CANDLE HOLDER
William J. O'Shea, 211 Lafayette Road, Nob Hill III, Syracuse, N.Y. 13205
Filed Feb. 9, 1976, Ser. No. 656,323
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2

245,874
COMBINATION OF HIGH INTENSITY LAMP AND BUILT-IN SOLID STATE CLOCK
Yiu Chung Lap, Lee Chung Industrial Bldg., 11 Pat Tat Street, San Po Kong, Kowloon, Hong Kong
Filed Mar. 11, 1976, Ser. No. 666,051
Claims priority, application United Kingdom, Nov. 27, 1975, 973407/75; Nov. 27, 1975, 973408/75
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 D

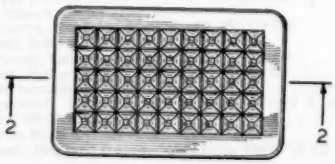
245,875
GUITAR HEAD
Bozo Podunavac, 713 E. Valley Parkway Blvd., Escondido, Calif. 92025
Filed July 14, 1975, Ser. No. 595,865
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

245,876
FLUTIST'S LYRE
George B. Sazama, P.O. Box 316, Mission, S. Dak. 57555
Filed Jan. 7, 1976, Ser. No. 646,962
Term of patent 14 years
Int. Cl. D17—*02*
U.S. Cl. D56—1 C

245,877
DECALCOMANIA FOR CULINARY WARE
William C. McBurney, New Castle, Pa., and Thomas J. Strawser, Jr., Corning, N.Y., assignors to Corning Glass Works
Filed Nov. 17, 1975, Ser. No. 632,452
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D59—2 A



245,878
SOAP BAR
David Jon Morrison, 1402 S. 78th St., Omaha, Nebr. 68127
Filed Mar. 27, 1975, Ser. No. 562,988
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D73—1 A



245,879

SOAP BAR

David Jon Morrison, 1402 S. 78th St., Omaha, Nebr. 68127

Filed May 19, 1975, Ser. No. 578,373

Term of patent 14 years

Int. Cl. D28—*02*

U.S. Cl. D73—1 A

245,880

COMBINED DISPLAY AND CARRYING CASE FOR A DRILL OR THE LIKE

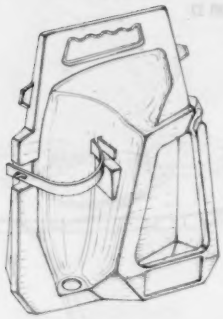
Donald A. Malcolm, Laureldale, Pa., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Oct. 15, 1974, Ser. No. 514,720

Term of patent 14 years

Int. Cl. D3—*99*

U.S. Cl. D87—1 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF SEPTEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See*—
Funderburk, William Henry, Jr., 4,049,821, Cl. 424-274.000.

A/S Ardal og Sunndal Verk: *See*—
Gjosteen, Ole Georg; Terum, Trygve Olavson; and Aarflot, Aksel Ola, 4,049,248, Cl. 266-202.000.

A-T-O Inc.: *See*—
Sullivan, John L.; Knauber, Veronica A.; and Nelson, James E., 4,049,164, Cl. 224-5.00W.

Aarflot, Aksel Ola: *See*—
Gjosteen, Ole Georg; Terum, Trygve Olavson; and Aarflot, Aksel Ola, 4,049,248, Cl. 266-202.000.

AB Akerlund & Rausing: *See*—
Persson, Lennart Gerhard, 4,049,188, Cl. 229-14.0BL.

AB Dellner-Malmco: *See*—
Bergs, Olof Sune, 4,049,129, Cl. 213-4.000.

AB Gotaverken: *See*—
Heyman, Klas, 4,048,937, Cl. 114-72.000.

AB Nynas-Petroleum: *See*—
Bergholm, Carl Arne, 4,049,543, Cl. 208-263.000.

AB Svenska Flaktfabriken: *See*—
Walker, George, 4,048,912, Cl. 98-115.0SB.

AB Telekontroll: *See*—
Andersson, Henry Veine; and Eriksson, Sven Vilhelm, 4,049,302, Cl. 292-201.000.

Abblard, Jean Georges: *See*—
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.

Abbott Laboratories: *See*—
Winn, Martin, 4,049,653, Cl. 544-150.000.

Abe, Noboru: *See*—
Kobashi, Toshiyuki; Ozaki, Masahiko; Ono, Kenichi; and Abe, Noboru, 4,049,605, Cl. 260-29.6AN.

Abe, Yoshinari: *See*—
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.

Abramoska, Alfred A., Jr., to Arthur Products Co. Vent tube with removable tip for filling containers. 4,049,030, Cl. 141-286.000.

Ace Envelope Manufacturing Corporation: *See*—
Ross, Joseph; and Fuchs, Ernest F., 4,049,364, Cl. 417-360.000.

Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED: *See*—
Blanpain, Jacques; and Delehouzee, Leon, 4,048,705, Cl. 29-420.000.

Acker, Ellsworth George; and Winyall, Milton Edward, to W. R. Grace & Co. Method of preparing loosely aggregated 200-500 millimicron silica. 4,049,781, Cl. 423-338.000.

Adachi, Terufumi; and Oda, Tatsuro, to Tokuyama Sekisui Kogyo Kabushiki Kaisha. Process for preparing chlorinated polymer or copolymer of vinyl chloride. 4,049,517, Cl. 204-159.180.

Adams, David John, to TBA Industrial Products Limited. Gaskets. 4,049,856, Cl. 427-131.000.

Addressograph-Multigraph Corporation: *See*—
Nothmann, Gerhard A., 4,048,920, Cl. 101-148.000.
Raschke, Curt R., 4,048,921, Cl. 101-426.000.

Adolph Gottscho, Inc.: *See*—
Navi, Menashe, 4,048,913, Cl. 101-27.000.

Aeschbach, Fritz, to Raskin S.A. Punching tool die. 4,048,890, Cl. 83-146.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Driole, Jean; Allibert, Colette; Bonnier, Etienne; and Wicker, Alain, 4,049,437, Cl. 75-10.00R.
Moisan, Michel; Leprince, Philippe; Beaudry, Claude; and Bloyet, Emile, 4,049,940, Cl. 219-10.55R.
Rigollot, Georges Alfred, 4,049,299, Cl. 290-52.000.

AGFA-Gevaert, A.G.: *See*—
Bestenreiner, Friedrich; and Giglberger, Dieter, 4,049,947, Cl. 219-216.000.
Boie, Immo; and Lowski, Dieter, 4,049,458, Cl. 96-100.00N.

AGFA-GEVAERT N.V.: *See*—
Van Doorselaer, Marcel Karel; and Bollen, Romain Henri, 4,049,454, Cl. 96-55.000.

Aguirre, Juan E., to Sintetica Americana, Inc. Process for modifying unsaturated polyester systems. 4,049,609, Cl. 260-29.6NR.

Ainslie, Norman George; Hempstead, Robert Douglas; Tan, Swie-In; and Valstyn, Erich Philipp, to International Business Machines Corporation. Low coercivity iron-silicon material, shields, and process. 4,049,522, Cl. 204-192.00M.

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Arndt, Edward J., 4,049,472, Cl. 148-16.000.
Dalton, Augustine I., Jr., 4,049,706, Cl. 260-514.00H.
Jepsen, Robert E., 4,048,909, Cl. 92-194.000.

Airco, Inc.: *See*—
Davis, Raymond L., II; and Beck, Robert I., 4,049,473, Cl. 148-16.500.

Akademie der Wissenschaften der D D R: *See*—
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.

Akaiwa, Yoshihiko: *See*—
Noguchi, Tautomu; Akaiwa, Yoshihiko; and Katoh, Hidehiko, 4,050,038, Cl. 333-1.100.

Akamatsu, Hideo: *See*—
Koitabashi, Takeo; and Akamatsu, Hideo, 4,049,456, Cl. 96-84.00R.

Aktiebolaget Leo: *See*—
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,799, Cl. 424-211.000.
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,800, Cl. 424-211.000.

Akzona Incorporated: *See*—
Eskridge, Brewster B.; Lyon, Boyce M.; and Boasson, Eduard H., 4,049,766, Cl. 264-210.00F.
Oosterwijk, Hendrik Harm Jannes; Wiersum, Ulfert Elle; Magre, Eduard Pieter; and van Dijk, Johannes Hendrinus, 4,049,726, Cl. 260-649.00R.
Penton, Harold Roy, Jr., 4,049,633, Cl. 260-75.00T.
Strade, Henry A., 4,049,805, Cl. 424-243.000.

Alacoop S. Coop.: *See*—
Gomez-Alecha, Laurentino, 4,049,173, Cl. 226-196.000.

Albers, Kenneth H.; and Holliday, Robert E., to Eastman Kodak Company. White non-pigmented hot melt polyolefin adhesives. 4,049,602, Cl. 260-27.00R.

Albers, Kenneth H., to Eastman Kodak Company. Polymeric compositions of styrene and amorphous polyolefins useful in preparing hot melt adhesives. 4,049,752, Cl. 260-878.00R.

Albright, James A., to Velsicol Chemical Corporation. Reactive flame retardants. 4,049,617, Cl. 260-45.80R.

Alcolac Inc.: *See*—
Steckler, Robert; Robinson, Fred; and Farmer, Robert F., III, 4,049,608, Cl. 260-29.6SQ.

Alday, James Marion; and Rowlands, Kenneth Charles, to Remington Arms Company, Inc. Magazine assembly for tournament trap. 4,048,976, Cl. 124-47.000.

Alder, Hanspeter; and Boving, Hans, to Swiss Aluminium Ltd. Protective material made of corundum crystals. 4,049,511, Cl. 204-67.000.

Aldridge, Jack P., III: *See*—
Robinson, C. Paul; Rockwood, Stephen D.; Jensen, Reed J.; Lyman, John L.; and Aldridge, Jack P., III, 4,049,515, Cl. 204-157.10R.

Alengoz, Anton Savvich: *See*—
Axelrod, Iosif Maxovich; Alengoz, Anton Savvich; Luchko, Viktor Nikolaevich; Mukhin, Valentin Alexandrovich; Nikolenko, Ignat Leontievich; and Potapenko, Igor Alexandrovich, 4,048,693, Cl. 15-310.000.

Alers, George A.; and Thompson, Robert B., to Rockwell International Corporation. Nondestructive detection of stress. 4,048,847, Cl. 73-67.50R.

Alexander, Michael N.: *See*—
Sagalyn, Paul L.; and Alexander, Michael N., 4,050,009, Cl. 324-.5AC.

Alexander, Robert L., to Hunt Manufacturing Co. Hanging file folder support frame. 4,049,127, Cl. 211-189.000.

Allegheny Ludlum Industries, Inc.: *See*—
Bloom, William M., 4,049,372, Cl. 432-246.000.

Allen & Hanburys Limited: *See*—
Harper, Norman James; and Veitch, George Bryan Austin, 4,049,663, Cl. 260-293.860.

Allibert, Colette: *See*—
Driole, Jean; Allibert, Colette; Bonnier, Etienne; and Wicker, Alain, 4,049,437, Cl. 75-10.00R.

Allied Chemical Corporation: *See*—
Gruber, William Paul, 4,049,935, Cl. 200-83.00P.
Ropp, Richard C., 4,049,779, Cl. 423-309.000.

Allis-Chalmers Corporation: *See*—
Atherton, Ralph R., 4,049,294, Cl. 280-756.000.
Barth, John W., 4,049,096, Cl. 192-4.00A.
Chacour, Selim A., 4,049,361, Cl. 415-170.00A.
Stich, Frederick A., 4,050,006, Cl. 363-98.000.

Alloway Manufacturing, Inc.: *See*—
Eisenhardt, Fred W.; and Tonsfeldt, Wayne S., 4,049,058, Cl. 171-58.000.

Aluminum Pechiney: *See*—
Morel, Paul; and Dugois, Jean-Pierre, 4,049,528, Cl. 204-243.00M.

Alvarez, Charles S.: *See—*
Chiodo, Daniel J.; and Alvarez, Charles S., 4,048,741, Cl. 42-1.0LP.

Amberg, Arthur A.: *See—*
Zetterlund, Ture R.; and Amberg, Arthur A., 4,049,305, Cl. 292-336.300.

American Air Filter Company, Inc.: *See—*
Goldsmith, Jesse M.; and O'Nan, Alex, Jr., 4,049,405, Cl. 55-479.000.
Rivers, Richard D., 4,049,406, Cl. 55-484.000.

American Cyanamid Company: *See—*
Asato, Goro, 4,049,717, Cl. 260-575.000.
Bright, John Harvey, 4,049,719, Cl. 260-606.50P.
Conrow, Ransom Brown; Bernstein, Seymour; and Bauman, Norman, 4,049,640, Cl. 260-175.000.
Haeger, Bruce Edwin; Krueger, James Elwood; Lowery, James Alfred; and Ritter, Lawrence, 4,049,809, Cl. 424-250.000.

American Home Products Corporation: *See—*
Freed, Meier E.; and Potoski, John R., 4,049,701, Cl. 560-130.000.

American Optical Corporation: *See—*
Chu, Nori Y. C.; and Piusz, Peter G., 4,049,567, Cl. 252-300.000.
Hovey, Richard J., 4,049,846, Cl. 427-164.000.
Laurin, Bernard L.; Rotenberg, Don H.; and Crandon, Harry D., 4,049,868, Cl. 428-412.000.

Ammco Tools, Inc.: *See—*
Mitchell, Wallace F., 4,048,858, Cl. 73-456.000.

AMP Incorporated: *See—*
Kobler, Robert James, 4,049,903, Cl. 174-68.500.

Anchor Continental, Inc.: *See—*
Anderson, Ralph L., 4,049,601, Cl. 260-24.000.

Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,049,619, Cl. 260-45.75B.

Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,049,620, Cl. 260-45.75R.

Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,049,623, Cl. 260-45.95G.

Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,049,624, Cl. 260-45.95G.

Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,049,625, Cl. 260-45.95G.

Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,049,626, Cl. 260-45.95G.

Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,049,627, Cl. 260-45.95G.

Anderson, Clifford E.: *See—*
Paitson, John Lloyd; and Anderson, Clifford E., 4,049,078, Cl. 181-120.000.

Anderson, Dean T.; and Vanous, Joseph A., to Rockwell International Corporation. Frequency division multiplex voice communication apparatus with hierarchy of stations. 4,049,914, Cl. 179-2.50R.

Anderson, Howard. Supports. 4,048,752, Cl. 47-47.000.

Anderson, Ralph L., to Anchor Continental, Inc. Moisture-resistant polyurethane-based pressure-sensitive adhesives. 4,049,601, Cl. 260-24.000.

Anderson, Robert F.: *See—*
Zabransky, Robert F.; and Anderson, Robert F., 4,049,739, Cl. 260-671.00R.

Anderson, Roger Norman, to Texas Instruments Incorporated. Continuous chemical vapor deposition reactor. 4,048,955, Cl. 118-49.500.

Anderson, Winton C.: *See—*
Lane, Marvin K.; and Anderson, Winton C., 4,049,866, Cl. 428-402.000.

Andersson, Henry Veine; and Eriksson, Sven Vilhelm, to AB Telekontroll. Safety lock mechanism. 4,049,302, Cl. 292-201.000.

Ando, Seigo: *See—*
Mori, Toshihiro; and Ando, Seigo, 4,050,011, Cl. 324-40.000.

Annen, Klaus: *See—*
Laurent, Henry; Annen, Klaus; Wiechert, Rudolf; and Hofmeister, Helmut, 4,049,804, Cl. 424-242.000.

Anthony, Albert M., to Tracor, Inc. Static convergence devices for color television picture tubes. 4,050,042, Cl. 335-212.000.

Antonov, Asparuh Mihaylov: *See—*
Nikolov, Ivan Dimov; Kortenski, Hristo Georgiev; Dimitrov, Dimiter Tanev; and Antonov, Asparuh Mihaylov, 4,049,041, Cl. 164-120.000.

Aoyama, Syuniti, to Nissan Motor Company, Limited. Exhaust gas recirculation system. 4,048,968, Cl. 123-119.00A.

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Ono, Fumio; and Aoyama, Yasuo, 4,049,831, Cl. 426-72.000.

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Wener, Kurt; Stock, Gunter; Herrig, Klaus; and Wagner, Heinz, 4,049,224, Cl. 245-6.000.

ARC Concrete Limited: *See—*
Farahar, Robert M., 4,049,022, Cl. 138-176.000.

Archilithic Company, The: *See—*
Winn, James Buchanan, Jr., 4,048,884, Cl. 83-24.000.

ARCO Medical Products Company: *See—*
Walters, Robert A.; and Kolenik, Steve A., 4,049,003, Cl. 128-419.0PG.
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ARCO Polymers, Inc.: *See—*
Straka, Daniel Charles, 4,049,587, Cl. 260-2.50L.

Arendt, Henry P., to Otis Engineering Corporation. Subsurface annulus safety valve. 4,049,052, Cl. 166-183.000.

Arff, John H., to Oregon Patent Development Company. Ozone generating system. 4,049,552, Cl. 210-192.000.

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Coker, Thomas G.; and Argade, Shyam D., 4,049,841, Cl. 427-34.000.

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Magnusson, Alan B.; and White, Howard S., 4,049,632, Cl. 260-75.0NE.

Armstrong, Kenneth Ronald: *See—*
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Wenckus, Joseph F.; Menashi, Wilson P.; and Castonguay, Roger A., 4,049,384, Cl. 23-273.0SP.

Arthur Products Co.: *See—*
Abramoska, Alfred A., Jr., 4,049,030, Cl. 141-286.000.

Arvin Industries, Inc.: *See—*
Scheitlin, George Edward; and Little, Richard Frederick, 4,049,388, Cl. 23-288.0FB.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Seko, Maomi; Miyake, Tetsuya; Inada, Kohji; Ochi, Kazushi; and Sakamoto, Tomio, 4,049,769, Cl. 423-7.000.

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Koenuma, Masao; and Gibu, Yoshitaka, 4,048,725, Cl. 33-81.000.

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Yamamoto, Takaharu; Nomura, Toshio; Asai, Tsuyoshi; and Hara, Akio, 4,049,876, Cl. 428-932.000.

Asato, Goro, to American Cyanamid Company. Novel 1,2,3,4-tetrahydro-4-oxo-(oxy)-1-naphthylamines and method of preparation thereof. 4,049,717, Cl. 260-575.000.

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Kovach, Stephen M.; and Wilson, George D., 4,049,576, Cl. 252-441.000.

Ateliers Belges Reunis: *See—*
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Atherton, Ralph R., to Allis-Chalmers Corporation. Narrow base protective frame. 4,049,294, Cl. 280-756.000.

Atlantic Richfield Company: *See—*
Erickson, Henry; and Mooi, John, 4,049,582, Cl. 252-466.0PT.
Russell, Donald H.; and Kremer, Charles J., 4,049,007, Cl. 132-7.000.
Sheng, Ming N.; and Mameniskis, Walter A., 4,049,724, Cl. 260-635.00H.

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Auberger, Jacques: *See—*
Lucas, Roger; and Auberger, Jacques, 4,048,828, Cl. 72-83.000.

Auborn, James J.; and Trickett, Elizabeth Ann, to GTE Laboratories Incorporated. Mandrel and method of manufacturing same. 4,049,024, Cl. 140-71.500.

Audette, Jacques Marcel: *See—*
Chu, Pak-Jong; and Audette, Jacques Marcel, 4,049,924, Cl. 179-90.00R.

Audio Pulse, Inc.: *See—*
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Bole, Karoly; Nagy, Kalman; Aufsatz, Istvan; Bohnert, Jozsef; Branyi, Laszlo; Ilyes, Zoltan; Korbuly, Jozsef; and Nemeth, Janos, 4,048,803, Cl. 61-45.00D.

Augustin, Friedhelm: *See—*
Mallek, Heinz; Jablonski, Werner; and Augustin, Friedhelm, 4,048,927, Cl. 110-8.00R.

Austin, Cecil Alfred, to Pictorial Machinery Limited. Camera projector with turret. 4,049,346, Cl. 355-45.000.

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Plumat, Emile; Baudin, Pol; Posset, Robert; and Autequitte, Jean-Marie, 4,048,978, Cl. 126-200.000.

Axelrod, Iosif Maxovich; Alengoz, Anton Savvich; Luchko, Viktor Nikolaevich; Mukhin, Valentin Alexandrovich; Nikolenko, Ignat Leontievich; and Potapenko, Igor Alexandrovich. Apparatus for regeneration of filters for antidust respirators. 4,048,693, Cl. 15-310.000.

Ayers, Ray R., to Shell Oil Company. Oil spill cleanup system. 4,049,554, Cl. 210-242.00S.

Ayres, John E.: *See—*
McDonald, Walter; Seitel, Norbert F.; and Ayres, John E., 4,049,081, Cl. 182-148.000.

Azar, Jack C.; Hoffend, Thomas A.; and Jacknow, Burton B., to Xerox Corporation. Imaging system. 4,049,447, Cl. 96-1.0SD.

Azzaroni, Cesare, to Azzaroni, Cesare. Automatic machine for unloading and reloading of plates in cassettes, particularly radiographs. 4,049,142, Cl. 214-301.000.

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Backderf, Richard Harold, 4,049,894, Cl. 526-62.000.

Babcock, Gary D., to Rockwell International Corporation. Laser accelerometer. 4,048,859, Cl. 73-516.00R.

Babcock-Hitachi K.K.: *See—*
Manabe, Toshikatsu; Ohta, Masao; Kudo, Tetsuichi; Mochizuki, Shouji; and Gejyo, Tetsuo, 4,049,789, Cl. 423-593.000.

Babcock & Wilcox, Limited: *See—*
McKenzie, Edwin Charles, 4,049,203, Cl. 241-52.000.

Babendererde, Siegmund: *See—*
Stuckmann, Dieter; Babendererde, Siegmund; Jutte, Hans; and Bokemeyer, Reinhard, 4,048,806, Cl. 61-85.000.

Bach, Josef; Kollwig, Horst; Meitzner, Wolfgang; Weintritt, Horst; and Ueberdiek, Ralf, to Hoechst Aktiengesellschaft. Process and device for forming a transfer tail. 4,049,209, Cl. 242-18.0PW.

Bach, Ricardo O.; and Morrison, Robert C., to Lithium Corporation of America. Continuous telomerization process and its liquid products. 4,049,732, Cl. 260-668.00B.

Bachhuber, Philip C.: *See—*
Bachhuber, Theodore J.; and Bachhuber, Philip C., 4,048,899, Cl. 86-39.000.

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Backman, William R., Jr.; and Chramiec, Mark A., to Raytheon Company. Data sample recording system. 4,050,057, Cl. 340-3.00F.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Eisentraeger, Klaus; Immel, Guenther; Marx, Matthias; Reinhard, Hans; Spoor, Herbert; and Storck, Gerhard, 4,049,847, Cl. 427-207.00B.

Badische Maschinenfabrik GmbH: *See—*
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Baguioro, Anastasia. Educational game apparatus. 4,048,731, Cl. 35-30.000.

Bailey, John V.: *See—*
Baron, Arthur L.; and Bailey, John V., 4,049,614, Cl. 260-37.0PC.

Bailey, Wesley T., to Chattem Drug & Chemical Company. Unsaturated polyesters combined with organoaluminum compounds. 4,049,748, Cl. 260-861.000.

Bainard, Dean R., to Garlock Inc. Unitized dual lip seal method. 4,049,281, Cl. 277-1.000.

Bair, James G., Jr., to Fox Grinders, Inc. Segmented grinding wheel. 4,048,762, Cl. 51-206.500.

Baker, Don R.; and Walker, Francis H., to Stauffer Chemical Company. N-dimethylpropynyl-α-methoxy-α-(3,5-dimethylphenoxy)acetamide herbicide. 4,049,423, Cl. 71-118.000.

Baker, Don R.; and Walker, Francis H., to Stauffer Chemical Company. N-t-butyl-2-(3,5-dichloro or dimethyl phenoxy)-2-alkoxy amide herbicides. 4,049,424, Cl. 71-118.000.

Baker Perkins Holdings Limited: *See—*
Wright, Edward James, 4,048,785, Cl. 53-122.000.

Bako, Lazlo; and Wingert, Rudolf, to Presto Lock Company, Division of Walter Kidde & Company, Inc. Combination padlock. 4,048,821, Cl. 70-25.000.

Ball, Edward: *See—*
Durenec, Peter, 4,049,149, Cl. 220-1.500.

Ball, Edward Thomas, to GTE Lenkurt Electric (Canada) Ltd. Apparatus for reducing the susceptibility of line signal repeaters to induced currents. 4,049,929, Cl. 179-170.00J.

Balleys, Francois; and Dupraz, Jean, to Ateliers des Charmilles S.A. Electric discharge machining method and device with preset electrode feed. 4,049,942, Cl. 219-69.00M.

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Lardon, Marcel; and Pulker, Hans, 4,049,352, Cl. 356-73.000.

Ban, Stephan C. Electrolytic hypochlorite generator. 4,049,531, Cl. 204-275.000.

Banasiak, Jozef: *See—*
Majewska, Janina; Grams, Wiktor; Rybicki, Zbigniew; and Banasiak, Jozef, 4,049,775, Cl. 423-224.000.

Bandermann, Friedhelm: *See—*
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Banyaszati Kutato Intezet: *See—*
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Baratoff, Paul, to Korfund Dynamics Corporation. Shock and vibration control system for forging hammer. 4,048,842, Cl. 72-455.000.

Barbre, Norris H.: *See—*
Martino, Paul D.; and Barbre, Norris H., 4,049,762, Cl. 264-94.000.

Bard Laboratories, Inc.: *See—*
Rice, John F.; Yundt, Albert P.; and Quast, Kenneth J., 4,049,457, Cl. 96-88.000.

Bardenheuer, Friedrich; and Kolb, Gustav. Sampling a steel converter. 4,048,857, Cl. 73-354.000.

Barnidge, Thomas O.; and Hasty, Russell D., to Danforth Agri-Resources. Slotted surface flooring for use in animal husbandry. 4,048,960, Cl. 119-28.000.

Baron, Arthur L.; and Bailey, John V., to Mobay Chemical Corporation. Pigmented polycarbonates. 4,049,614, Cl. 260-37.0PC.

Barone, Bruno J.: *See—*
Kerr, Ralph O.; and Barone, Bruno J., 4,049,574, Cl. 252-437.000.

Barry, James D.; and Brandelik, Joseph E., to United States of America, Air Force. In cavity pumping for infrared laser. 4,050,034, Cl. 331-94.50G.

Barth, John W., to Allis-Chalmers Corporation. Parking brake release for transmission clutch. 4,049,096, Cl. 192-4.00A.

Bartha, Peter: *See—*
Tutsek, Alexander; and Bartha, Peter, 4,049,464, Cl. 106-288.00B.

Bartholomew, Ralph L.: *See—*
Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., 4,049,844, Cl. 427-54.000.

Bartolini, Robert Alfred: *See—*
Bloom, Allen; and Bartolini, Robert Alfred, 4,049,459, Cl. 96-115.00R.

Barwald, Gunter; and Briem, Fritz. Hops and method of making same. 4,049,834, Cl. 426-106.000.

BASF Aktiengesellschaft: *See—*
Burdorf, Donald L.; and Bjordahl, James, 4,049,216, Cl. 242-192.000.
Doerfel, Helmut; and Cordes, Claus, 4,049,638, Cl. 260-78.00L.
Erdmann, Hans; and Miller, Franz-Friedrich, 4,049,379, Cl. 8-94.260.
Falkenstein, Georg; Stein, Dieter; Haaf, Franz; Heinz, Gerhard; and Schoen, Ernst, 4,049,590, Cl. 260-2.5BE.
Fleig, Helmut; Hagen, Helmut; Naarmann, Herbert; and Penzien, Klaus, 4,049,622, Cl. 260-2.5HB.
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Hamprecht, Gerhard; and Kersten, Siegfried, 4,049,709, Cl. 260-543.00R.
Nissen, Axel; Fliege, Werner; and Voges, Dieter, 4,049,571, Cl. 252-430.000.
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Weitz, Hans-Martin; Wagner, Ulrich; Volkamer, Klaus; Schubert, Eckart; and Bandermann, Friedhelm, 4,049,742, Cl. 260-681.50R.

BASF Wyandotte Corporation: *See—*
Coker, Thomas G.; and Argade, Shyam D., 4,049,841, Cl. 427-34.000.
Dutton, Daniel Ronan; and Musolf, Thomas Carl, 4,049,525, Cl. 204-195.00C.

Baty, Charlton Robert; and Jarvis, Alfred John, to Decca Limited. Data retention apparatus. 4,049,951, Cl. 235-92.0FP.

Batzer, Othmer F.: *See—*
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Baudin, Pol: *See—*
Plumat, Emile; Baudin, Pol; Posset, Robert; and Autequitte, Jean-Marie, 4,048,978, Cl. 126-200.000.

Baulch, Evelyn Mae; and Baulch, John Alan. Patient lift board. 4,048,681, Cl. 5-81.00R.

Baulch, John Alan: *See—*
Baulch, Evelyn Mae; and Baulch, John Alan, 4,048,681, Cl. 5-81.00R.

Bauman, Norman: *See—*
Conrow, Ransom Brown; Bernstein, Seymour; and Bauman, Norman, 4,049,640, Cl. 260-175.000.

Baumann, Jan; and Petter, Franz, to Gea Luftkuhlergesellschaft Happel GmbH & Co. KG. Axial flow fan with adjustable blades. 4,049,363, Cl. 416-157.00B.

Baxter Travenol Laboratories, Inc.: *See—*
Mittleman, Herbert, 4,048,995, Cl. 128-214.00R.
Mittleman, Herbert; and Schopen, Joseph L., 4,048,996, Cl. 128-214.00R.
Ralston, Philip G., Jr., 4,049,033, Cl. 105-.500.
Vcelka, John Leonard; and Winchell, David A., 4,049,034, Cl. 150-8.000.
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Bayer Aktiengesellschaft: *See—*
Becker, Wolf-Jurgen; Breuer, Wolfram; and Deprez, Jacques, 4,049,503, Cl. 204-1.00T.
Bunge, Wilhelm; Last, Wolf-Dieter; Saitner, Rudolf; and Wolf, Karlheinz, 4,049,610, Cl. 260-31.20N.
Jager, Horst, 4,049,704, Cl. 260-507.00R.
Metzger, Carl; Eue, Ludwig; and Hack, Helmuth, 4,049,670, Cl. 260-306.80D.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,049,662, Cl. 260-287.00D.
Paulus, Wilfried; Scheinpflug, Hans; and Genth, Hermann, 4,049,807, Cl. 424-246.000.
Perrey, Hermann; Schulze, Jurgen; Rosenkranz, Hans Jurgen; Rudolph, Hans; and Hornle, Reinhold, 4,049,378, Cl. 8-87.000.
Schuster, Karl Ernst; Rosenkranz, Hans Jurgen; and Rudolph, Hans, 4,049,745, Cl. 260-837.00R.
Straub, Otto-Christian, 4,049,794, Cl. 424-167.000.
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Timmler, Helmut; Draber, Wilfried; Buchel, Karl Heinz; and Lurssen, Klaus, 4,049,418, Cl. 71-76.000.
Weissel, Oskar, 4,049,584, Cl. 252-470.000.

BBC Brown Boveri & Company, Limited: *See—*
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Beall, Nelson J.: *See—*
Brastad, William A.; and Beall, Nelson J., 4,048,786, Cl. 53-159.000.

Bear, Harold F.: *See—*
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Bear Industries, Inc.: *See—*
Downing, James H.; and Bear, Harold F., 4,049,145, Cl. 214-519.000.

Beatty, Bennie V., to Beatty, Lillie Evelyn. Method of repairing welded pipe sections. 4,049,941, Cl. 219-61.000.

Beatty, Lillie Evelyn: *See—*
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Beatty, Theodore Robert, to Union Carbide Corporation. Battery assembly. 4,049,882, Cl. 429-94.000.

Beaudry, Claude: *See—*
Moisan, Michel; Leprince, Philippe; Beaudry, Claude; and Bloyet, Emile, 4,049,940, Cl. 219-10.55R.

Bechtel International Corporation: *See—*
Ellers, Fred S.; Hally, Hugh G.; McIlveen, Edward E.; and Doble, William A., 4,048,807, Cl. 61-105.000.

Beck, Robert I.: *See—*
Davis, Raymond L., II; and Beck, Robert I., 4,049,473, Cl. 148-16.500.

Becker, Erich. Diaphragm pump. 4,049,366, Cl. 417-569.000.

Becker, Wolf-Jurgen; Breuer, Wolfram; and Deprez, Jacques, to Bayer Aktiengesellschaft. Electrochemical gas detection. 4,049,503, Cl. 204-1.00T.

Beckering, Jacobus Jan: *See—*
Owings, Peter Russell; Beckering, Jacobus Jan; and Bunyea, Roderick Francis, 4,050,003, Cl. 320-2.000.

Beckman Instruments, Inc.: *See—*
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Bednarczyk, Jan: *See—*
Dunikowski, Andrzej; Bednarczyk, Jan; Keska, Jerzy; Pisarkiewicz, Tadeusz; and Zamarski, Andrzej, 4,048,844, Cl. 73-32.00R.

Beeby, Philip J., to Syntex (U.S.A.) Inc. Cephalosporin type antibacterials. 4,049,806, Cl. 424-246.000.

Beecham Group Limited: *See—*
Harnden, Michael Raymond; and Wright, Nicholas David, 4,049,816, Cl. 424-270.000.

Beehive Machinery Inc.: *See—*
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Beemer, Richard B.; and Hennessey, Richard G., to International Harvester Company. Audible lining wear indicator. 4,049,084, Cl. 188-1.00A.

Beggs, Donald, to Midrex Corporation. Method for producing metallic iron pellets. 4,049,440, Cl. 75-35.000.

Beitzel, Stuart Wallace: *See—*
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Bell & Howell Company: *See—*
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Gaynor, Joseph, 4,049,843, Cl. 427-43.000.

Bell & Howell Limited: *See—*
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Bell, John T., to Container Corporation of America. Apparatus for handling and moving articles. 4,049,130, Cl. 214-8.50A.

Bell, Malcolm Charles Evert; and Sridhar, Ramamritham, to International Nickel Company, Inc., The. Process for treatment of lateritic ores. 4,049,444, Cl. 75-82.000.

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Sridhar, Ramamrithan; Warner, John Stuart; and Bell, Malcolm Charles Evert, 4,049,438, Cl. 75-21.000.

Bell, Malcolm R., to Sterling Drug Inc. 3-[2-(4-Anisidino)phenyl]-1-phenyl-1-propiophenones and propanols. 4,049,715, Cl. 260-571.000.

Bell, Richard; Sato, Takao; and Lahiri, Chitta Ranjan, to Uniroyal Limited; Uniroyal, Inc.; and Unitta Company Limited. Transmission belts. 4,048,865, Cl. 74-231.00R.

Bell Telephone Laboratories, Incorporated: *See—*
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French, William George, 4,049,413, Cl. 65-3.00A.
Knollman, Dieter John Henry, 4,049,920, Cl. 179-18.0BC.
Koontz, Donald Eldridge, 4,049,471, Cl. 148-13.000.
Peck, Richard John, 4,049,909, Cl. 178-67.000.

Bell, Theodore F. Index table. 4,049,252, Cl. 269-57.000.

Belles, Wayne Stuart: *See—*
Shen, Kelvin Kei-Wei; and Belles, Wayne Stuart, 4,049,422, Cl. 71-92.000.

Bennett, Howard M.: *See—*
Dent, Joseph B., Jr.; Martin, Walter L., Jr.; and Bennett, Howard M., 4,049,412, Cl. 65-2.000.

Bennett, R. Jackson; and Connors, Daniel F. Air purifying apparatus. 4,049,400, Cl. 55-139.000.

Bennett, Thomas H.; and Wiles, Michael F., to Motorola, Inc. Pulse expanding system for microprocessor systems with slow memory. 4,050,096, Cl. 364-200.000.

Beno, Lawrence A.; and Doi, Kazumasa, to United States of America, Navy. Programmable microwave modulator. 4,050,070, Cl. 343-6.8LC.

Benton, Lawrence M., Jr. Visual display with backlighting. 4,048,739, Cl. 40-106.100.

Berg, Robert L.; Murphy, William J.; and Simmons, Dennis E., Jr., to United States of America, Air Force. Augmented tracking system. 4,050,068, Cl. 343-6.00R.

Bergami, Samuel S., Jr.; and Bergami, Samuel S., Sr. Fireplace heater, circulator, and humidifier system. 4,049,196, Cl. 237-51.000.

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Bergami, Samuel S., Jr.; and Bergami, Samuel S., Sr., 4,049,196, Cl. 237-51.000.

Berger, Helmut; Holzermer, Gunther; Kirsch, Harry; and Vijlbrief, Pieter, to Siemens Aktiengesellschaft. X-ray examining apparatus including a tomographic exposure installation. 4,049,967, Cl. 250-445.00T.

Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, to Boehringer Mannheim G.m.b.H. Compositions using cycloalkano-quinolone derivatives and their method of use. 4,049,811, Cl. 424-258.000.

Berger, Rupert: *See—*
Moser, Peter; Eysn, Manfred; Enkner, Bernhard; Berger, Rupert; Wagner, Wolfgang; and Spannlang, Ronald, 4,049,249, Cl. 266-247.000.

Berghoff, Wellington Franklyn, to ISIS Chemicals, Inc. Heat convertible coating compositions. 4,049,607, Cl. 260-29.4UA.

Bergholm, Carl Arne, to AB Nynas-Petroleum. Method for the separation of a mixture of petroleum acids from petroleum distillates containing such a mixture. 4,049,543, Cl. 208-263.000.

Bergs, Olof Sune, to AB Dellner-Malmco. Automatic coupling for streetcars and the like. 4,049,129, Cl. 213-4.000.

Bergwerksverband GmbH: *See—*
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Berico Industries, Inc.: *See—*
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Bernstein, Seymour: *See—*
Conrow, Ransom Brown; Bernstein, Seymour; and Bauman, Norman, 4,049,640, Cl. 260-175.000.

Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, to Boehringer Mannheim G.m.b.H. γ-Glutamyl-4-nitroanilide compounds. 4,049,702, Cl. 260-501.120.

Bertaud, Francois X.: *See—*
Ouska, Ralph C.; and Bertaud, Francois X., 4,049,328, Cl. 308-187.100.

Berti, Eugenio: *See—*
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Bestenreiner, Friedrich; and Giglberger, Dieter, to AGFA-Gevaert, A.G. Method and arrangement for protecting sheets from charring in copying machines. 4,049,947, Cl. 219-216.000.

Beveridge, John; Davies, Thomas Roderick Harries; Fidler, Fred; and Ring, Maurice Frank, to Metal Box Limited. Container and method of forming same. 4,048,935, Cl. 113-120.00F.

Bhuta, Pravin G.: *See—*
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Bianchi, Sergio; Bornengo, Mario; and Frangioni, Alessandro, to Montedison S.p.A. Process for preparing 0,0-dimethyldithiophosphoric acid and alkaline salts thereof. 4,049,755, Cl. 260-987.000.

Bianchi, Valerio; Latsch, Reinhard; and Schmidt, Peter, to Robert Bosch GmbH. Apparatus for determining the fuel injection quantity in mixture compressing internal combustion engines. 4,048,965, Cl. 123-32.0EA.

Bierbach, Herbert; Dittmar, Heinz; Heinz, Ernst; Hohmann, Klaus; and Rennhack, Rolf, to Metallgesellschaft Aktiengesellschaft. Thermal transformation of metal chlorides to oxides in a fluidized bed. 4,049,788, Cl. 423-592.000.

Billings, Ronald Joseph: *See—*
George, Henry Howard; and Billings, Ronald Joseph, 4,049,356, Cl. 403-173.000.

Bio-Medicus, Inc.: *See—*
Kletschka, Harold D.; and Rafferty, Edson D., 4,049,002, Cl. 128-318.000.

Biometrics Instrument Corporation: *See—*
Maginness, Brian K., 4,050,005, Cl. 363-59.000.

Birney, Richard Eugene; and Hood, Robert Allen, to International Business Machines Corporation. Equate operand address space control system. 4,050,060, Cl. 364-200.000.

Biver, Christian: *See—*
Clerbois, Lucien; Degueldre, Louis; Biver, Christian; Degols, Albert; and Gobillon, Yves, 4,049,532, Cl. 204-290.00F.

Bjordahl, James: *See—*
Burdorf, Donald L.; and Bjordahl, James, 4,049,216, Cl. 242-192.000.

Blachford, John, to H. L. Blachford Limited. Amide waxes. 4,049,680, Cl. 260-404.500.

Black Clawson Fibreclaim, Inc.: *See—*
Marsh, Paul G., 4,049,391, Cl. 44-10.00R.

Black and Decker Manufacturing Company, The: *See—*
Owings, Peter Russell; Beckering, Jacobus Jan; and Bunyea, Roderick Francis, 4,050,003, Cl. 320-2.000.

Blackburne, Robin Michael. Rackets. 4,049,269, Cl. 273-73.00D.

Blackmon, Macy B., to Raymond Lee Organization, Inc., The, a part interest. Key case. 4,048,824, Cl. 70-456.00R.

Blanpain, Jacques; and Delehouzee, Leon, to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED. Method of making soldering wire constituted by a core of powder and a metallic tube enclosing the core. 4,048,705, Cl. 29-420.000.

Bloem, Herman, to U.S. Philips Corporation. Method of joining a metal part having a copper surface and a glass part. 4,049,416, Cl. 65-32.000.

Bloom, Allen; and Bartolini, Robert Alfred, to RCA Corporation. Organic volume phase holographic recording medium. 4,049,459, Cl. 96-115.00R.

Bloom, William M., to Allegheny Ludlum Industries, Inc. Apparatus for supporting and removing a work supporting roll. 4,049,372, Cl. 432-246.000.

Bloyet, Emile: *See—*
Moisan, Michel; Leprince, Philippe; Beaudry, Claude; and Bloyet, Emile, 4,049,940, Cl. 219-10.55R.

Blum, Adolf: *See—*
Schwab, Hermann; and Blum, Adolf, 4,049,377, Cl. 8-169.000.

Blunier, Donald E., to Safety Racing Equipment, Incorporated. Caliper brake with assembly for rotor attachment to hub. 4,049,085, Cl. 188-18.00A.

Board of Trustees Western Washington State College: *See—*
Seal, Michael R., 4,049,309, Cl. 296-1.00S.
Boasson, Eduard H.: *See—*
Eskridge, Brewster B.; Lyon, Boyce M.; and Boasson, Eduard H., 4,049,766, Cl. 264-210.00F.
Bobrovsky, Vasily Mikhailovich: *See—*
Zakharov, Evegny Dmitrievich; Shneider, Gennady Lvovich; Valkov, Viktor Dmitrievich; Kapitonov, Viktor Pavlovich; Miklyaev, Petr Grigorievich; Lebedev, Vladimir Alexandrovich; Kholnova, Vera Ivanovna; Shesterikov, Stanislav Alexeevich; and Bobrovsky, Vasily Mikhailovich, 4,049,474, Cl. 148-32.500.
Bockstiegel, Gerd-Edzard; Neidhardt, Manfred; Rehfeld, Gerhard; and Umlauf, Werner, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of granulated abrasives from fused or sintered refractory inorganic hard substances having a high grain toughness. 4,049,397, Cl. 51-309.00A.
Bodor, Nicolae S.; and Kaminski, James J., to INTERx Research Corporation. 3-Chloro-1,3-oxazines or oxazolidines as antibacterial agents. 4,049,818, Cl. 424-272.000.
Boehnke, Ralf-Dieter; and Gotze, Waldemar, to U.S. Philips Corporation. Method of and device for providing thin layers by cathode sputtering. 4,049,523, Cl. 204-192.00R.
Boehringer Mannheim G.m.b.H.: *See—*
Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, 4,049,811, Cl. 424-258.000.
Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 4,049,702, Cl. 260-501.120.
Boeing Company, The: *See—*
Dean, Roy Delmar; and Weiland, Richard Herschel, 4,049,219, Cl. 244-217.000.
Souslin, Richard Ervin, 4,048,905, Cl. 91-405.000.
Boggs, Jesse K., to Exxon Research & Engineering Co. Amine promoters for hydrohalogenation. 4,049,730, Cl. 260-663.000.
Bohnenstingl, Josef; Laser, Manfred; Lossmann, Gunter; and Gebhard, Helmut, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Apparatus for carrying out chlorinating reactions. 4,049,385, Cl. 23-277.00R.
Bohnert, Jozsef: *See—*
Bole, Karoly; Nagy, Kalman; Aufsatz, Istvan; Bohnert, Jozsef; Branyi, Laszlo; Ilyes, Zoltan; Korbuly, Jozsef; and Nemeth, Janos, 4,048,803, Cl. 61-45.00D.
Boie, Immo; and Lowski, Dieter, to AGFA-Gevaert, A.G. Photographic silver halide material containing 2-equivalent yellow couplers. 4,049,458, Cl. 96-100.00N.
Bokemeyer, Reinhard: *See—*
Stuckmann, Dieter; Babendererde, Siegmund; Jutte, Hans; and Bokemeyer, Reinhard, 4,048,806, Cl. 61-85.000.
Bole, Karoly; Nagy, Kalman; Aufsatz, Istvan; Bohnert, Jozsef; Branyi, Laszlo; Ilyes, Zoltan; Korbuly, Jozsef; and Nemeth, Janos, to Banyaszati Kutato Intezet. Mining shield support apparatus. 4,048,803, Cl. 61-45.00D.
Bollen, Romain Henri: *See—*
Van Doorselaer, Marcel Karel; and Bollen, Romain Henri, 4,049,454, Cl. 96-55.000.
Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., to General Electric Company. Method for making a circuit board and article made thereby. 4,049,844, Cl. 427-54.000.
Bolton, Frank Harold, deceased: *See—*
Morehouse, Donald S., Jr.; and Bolton, Frank Harold, deceased, 4,049,604, Cl. 260-29.6RW.
Bolton, Kathryn M., administratrix: *See—*
Morehouse, Donald S., Jr.; and Bolton, Frank Harold, deceased, 4,049,604, Cl. 260-29.6RW.
Bom, Cornelis Johannes Gerardus: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,049,061, Cl. 172-49.000.
Bonnard, Louis Antoine; and Pierron, Claude Raymond. Machines for cutting cardboard and other articles. 4,048,888, Cl. 83-89.000.
Bonnier, Etienne: *See—*
Driole, Jean; Allibert, Colette; Bonnier, Etienne; and Wicker, Alain, 4,049,437, Cl. 75-10.00R.
Boone, Gary W.; and Vandierendonck, Jerry L., to Texas Instruments Incorporated. Precharge arithmetic logic unit. 4,049,974, Cl. 307-205.000.
Borg-Warner Corporation: *See—*
Leedham, Harry W. T., 4,049,048, Cl. 165-159.000.
Polomski, John; Schulz, Willis Lorenz; and Specht, Victor Joseph, 4,049,094, Cl. 192-3.310.
Bornengo, Mario: *See—*
Bianchi, Sergio; Bornengo, Mario; and Frangioni, Alessandro, 4,049,755, Cl. 260-987.000.
Bosco, Peter Michael: *See—*
Gannis, Peter Michael; and Bosco, Peter Michael, 4,049,833, Cl. 426-93.000.
Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,049,662, Cl. 260-287.00D.
Bossler, Franklin B.: *See—*
Chambers, William A.; Bossler, Franklin B.; and Brandkamp, Warren F., 4,050,036, Cl. 331-94.50C.
Botkins, Walter Y., to Berico Industries, Inc. Recirculating grain dryer. 4,048,727, Cl. 34-13.000.
Bottomley, William K., to Bottomley, William K.; Brightwell, O. J.; and Newell, Thomas J., III. Method for the treatment of Herpes Simplex. 4,049,798, Cl. 424-195.000.
Bottum, Edward W. Solar assisted heat pump system. 4,049,407, Cl. 62-2.000.
Boudreaux, Bettie M. Ironing board cabinet. 4,049,332, Cl. 312-237.000.
Bouju, Michel. Seat belt security release mechanism. 4,049,293, Cl. 280-744.000.
Bourke, Donall Garraid, to International Business Machines Corporation. Translator lookahead controls. 4,050,094, Cl. 364-200.000.
Boving, Hans: *See—*
Alder, Hanspeter; and Boving, Hans, 4,049,511, Cl. 204-67.000.
Bower, Thomas E., to Owens-Illinois, Inc. Tape reel shipping folder. 4,049,120, Cl. 206-396.000.
Bowley, Wallace William, to Ritchie, William Barney, Jr., a part interest. Floating wave barrier. 4,048,802, Cl. 61-5.000.
Boxer, Trevor Charles, to Joseph Lucas Limited. Control circuit for an electrically driven vehicle. 4,049,998, Cl. 318-258.000.
Boyer, Charles: *See—*
Haviland, Herbert, deceased; Haviland, Diane, administratrix; Smith, Arthur; and Boyer, Charles, 4,049,193, Cl. 236-46.00R.
Brammall, Inc.: *See—*
Irwin, George; and Butler, Gary, 4,049,303, Cl. 292-307.00R.
Branan, Floyd: *See—*
Durenec, Peter, 4,049,149, Cl. 220-1.500.
Brand, Herbert: *See—*
Raab, Richard; Spindler, Kurt; Brand, Herbert; and Gast, Leonard, 4,048,832, Cl. 72-255.000.
Brand, Michael J.: *See—*
Burns, Donald A.; Brand, Michael J.; and Saunders, Alexander M., 4,049,381, Cl. 23-230.00R.
Brandelik, Joseph E.: *See—*
Barry, James D.; and Brandelik, Joseph E., 4,050,034, Cl. 331-94.50G.
Brandin, Johan A. I., to Stal Refrigeration AB. Device for establishing and breaking a fluid communication. 4,049,233, Cl. 251-61.100.
Brandkamp, Warren F.: *See—*
Chambers, William A.; Bossler, Franklin B.; and Brandkamp, Warren F., 4,050,036, Cl. 331-94.50C.
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., to International Paper Company. Viscous dispersion for forming wet-laid, non-woven fabrics. 4,049,491, Cl. 162-101.000.
Branin, Phyllis Brown: *See—*
Lozier, Gerald Scott; and Branin, Phyllis Brown, 4,049,845, Cl. 427-68.000.
Brannan, Raymond: *See—*
King, Mendel; and Brannan, Raymond, 4,049,358, Cl. 404-11.000.
Branyi, Laszlo: *See—*
Bole, Karoly; Nagy, Kalman; Aufsatz, Istvan; Bohnert, Jozsef; Branyi, Laszlo; Ilyes, Zoltan; Korbuly, Jozsef; and Nemeth, Janos, 4,048,803, Cl. 61-45.00D.
Brastad, William A.; and Beall, Nelson J., to General Mills, Inc. Circular package loader. 4,048,786, Cl. 53-159.000.
Braun, Daniel E.: *See—*
Harkness, Joseph R.; and Braun, Daniel E., 4,048,787, Cl. 56-11.300.
Breedis, John F.: *See—*
Watson, W. Gary; and Breedis, John F., 4,049,426, Cl. 75-153.000.
Brener, William: *See—*
Durenec, Peter, 4,049,149, Cl. 220-1.500.
Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., to Texaco Development Corporation. Preparation of N-(aminoalkyl)piperazine. 4,049,657, Cl. 260-268.0SY.
Brenner, Walter. One component shelf stable low shrinkage structural adhesive systems. 4,049,750, Cl. 260-864.000.
Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Game device. 4,049,272, Cl. 273-95.00R.
Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. Alkoxy and alkylthioalkylureido cephalosporins. 4,049,651, Cl. 544-21.000.
Breuer, Wolfram: *See—*
Becker, Wolf-Jurgen; Breuer, Wolfram; and Deprez, Jacques, 4,049,503, Cl. 204-1.00T.
Bridgestone Tire Company Limited: *See—*
Kawakami, Hiroshi; Nagaoka, Isao; and Tsukagawa, Yukio, 4,049,170, Cl. 226-74.000.
Briem, Fritz: *See—*
Barwald, Gunter; and Briem, Fritz, 4,049,834, Cl. 426-106.000.
Briggs & Stratton Corporation: *See—*
Harkness, Joseph R.; and Braun, Daniel E., 4,048,787, Cl. 56-11.300.
Kamlukin, Igor; and Harkness, Joseph R., 4,048,788, Cl. 56-11.300.
Bright, John Harvey, to American Cyanamid Company. Process for preparing bis(hydroxymethyl) methylphosphine oxide. 4,049,719, Cl. 260-606.5P.
Brightwell, O. J.: *See—*
Bottomley, William K., 4,049,798, Cl. 424-195.000.
Briles, Franklin S. Riveting method expanding a work counterbore. 4,048,708, Cl. 29-509.000.
Briles, Paul R.: *See—*
Salter, Larry, 4,048,898, Cl. 85-77.000.
Brilovich, Gregorio; and Masserant, Irvin F., to Memorex Corporation. Magnetic coating composition. 4,049,566, Cl. 252-62.540.
Bristol-Myers Company: *See—*
Cotty, Val F.; Sterbenz, Francis J.; and Melman, Kenneth J., 4,049,803, Cl. 424-233.000.
British Gas Corporation: *See—*
Nicklin, Thomas; and Hughes, Dorothy, 4,049,776, Cl. 423-226.000.

Broadbent, David J., to S. C. Johnson & Son, Inc. Roach bait composition. 4,049,460, Cl. 106-15.00R.

Brodmann, George, to PPG Industries, Inc. Backcoating of polypropylene fabric. 4,049,870, Cl. 428-424.000.

Broeils, John: *See—*
Silverman, Stanley; and Broeils, John, 4,048,916, Cl. 101-40.000.

Brois, Stanley J.: *See—*
Ryer, Jack; Zielinski, James; Miller, Harold N.; and Brois, Stanley J., 4,049,564, Cl. 252-51.50A.

Brookes, Cyril James, to Reed Building Products, Pty. Limited. Covering piece for a water closet assembly. 4,048,676, Cl. 4-1.000.

Brookes, Malcolm J.; Sheridan, James A.; and Spranger, Douglas M. Ladder caddy. 4,049,283, Cl. 280-47.13R.

Brosch, Eric Joseph: *See—*
Woidke, Richard Paul; Wester, Thomas Joseph; and Brosch, Eric Joseph, 4,048,861, Cl. 74-56.000.

Brothers, Magdalena M., executrix: *See—*
Brothers, Richard V., deceased; and Brothers, Magdalena M., executrix, 4,049,008, Cl. 132-33.00B.

Brothers, Richard V., deceased; and by Brothers, Magdalena M., executrix. Hair-curling device. 4,049,008, Cl. 132-33.00B.

Brouwer, Frans, to Sloan, Albert E. Spray dispenser. 4,049,197, Cl. 239-218.500.

Brown, Cicero C., deceased (by Brown, Joe R., executor), to Brown Oil Tools, Inc. Check valve assembly. 4,049,015, Cl. 137-496.000.

Brown, Frederick L., to Dow Chemical Company, The. Inhibiting leaching of fire retardant salts from wood with cyclic sulfonium zwitterion solution impregnant. 4,049,849, Cl. 427-325.000.

Brown, Harold E. Porta-crane. 4,049,238, Cl. 254-139.100.

Brown, Howard R.: *See—*
Hurlburt, Joseph C.; Brown, Howard R.; and Buck, Ernest E., 4,048,862, Cl. 74-57.000.

Brown, Joe R., to Brown Oil Tools, Inc. Gravel pack method, retrievable well packer and gravel pack apparatus. 4,049,055, Cl. 166-278.000.

Brown, Joe R., executor: *See—*
Brown, Cicero C., deceased, 4,049,015, Cl. 137-496.000.

Brown Oil Tools, Inc.: *See—*
Brown, Cicero C., deceased, 4,049,015, Cl. 137-496.000.
Brown, Joe R., 4,049,055, Cl. 166-278.000.

Brown, Robert Campbell: *See—*
Casey, James H.; Larson, Curtis Lee; and Brown, Robert Campbell, 4,049,854, Cl. 428-72.000.

Brown & Williamson Tobacco Corporation: *See—*
Grimm, Wolfgang H., 4,049,117, Cl. 206-270.000.

Browne, Joseph N. Clamp means and support for skis, in combination. 4,048,700, Cl. 280-11.37K.

Bruck, Gernot Klaus, to DIHACO Diamanten Handels Compagnie Est. Process and apparatus for detecting inclusions. 4,049,350, Cl. 356-30.000.

Brunty, Fred. Multi-purpose labor-saver wheeled tool. 4,048,735, Cl. 37-130.000.

Brush, John D., Jr.; and Burgess, George M., to John D. Brush & Co., Inc. Safe. 4,048,926, Cl. 109-65.000.

Buchel, Karl Heinz: *See—*
Timmler, Helmut; Draber, Wilfried; Buchel, Karl Heinz; and Lurssen, Klaus, 4,049,418, Cl. 71-76.000.

Bucholtz, Glen E.; and Finegold, Hyman B., to Globe Tool and Engineering Company, The. Chuck spindle positioning mechanism for armature winding machine. 4,049,208, Cl. 242-7.05B.

Buck, Ernest E.: *See—*
Hurlburt, Joseph C.; Brown, Howard R.; and Buck, Ernest E., 4,048,862, Cl. 74-57.000.

Buell, Erik F. Brake discs. 4,049,090, Cl. 188-251.00M.

Bufarale, Rolando: *See—*
Genevois, Jean Louis; and Bufarale, Rolando, 4,049,900, Cl. 13-7.000.

Buiatti, Marina, to SELENIA-Industrie Elettroniche Associate S.p.A. Processes for manufacturing semiconductor devices. 4,048,712, Cl. 29-571.000.

Buljovcic, Stephan, to Rene Cosson S.A. Self-fragmentable bullet. 4,048,922, Cl. 102-92.700.

Bullis, Robert H.; and Wiegand, Walter J., Jr., to United Technologies Corporation. Ion production means. 4,049,989, Cl. 313-230.000.

Bulova Watch Company, Inc.: *See—*
Risi, Rene, 4,048,795, Cl. 58-4.00R.

Bulten, Eric J.: *See—*
Verbeek, Francois; Bulten, Eric J.; and van den Hurk, Jan W. G., 4,049,689, Cl. 260-429.700.

Bundy, Gordon L., to Upjohn Company, The. PG-type, 1,9-lactones. 4,049,648, Cl. 542-426.000.

Bunge, Wilhelm; Last, Wolf-Dieter; Saitner, Rudolf; and Wolf, Karlheinz, to Bayer Aktiengesellschaft. Pigment preparations. 4,049,610, Cl. 260-31.20N.

Bunker Ramo Corporation: *See—*
Nijman, John Peter, 4,048,710, Cl. 29-566.400.
Riches, Arthur John, 4,048,874, Cl. 81-57.310.

Bunting, Keith Brian, to Simon Container Machinery Limited. Waste collection systems. 4,049,321, Cl. 302-41.000.

Bunyea, Roderick Francis: *See—*
Owings, Peter Russell; Beckering, Jacobus Jan; and Bunyea, Roderick Francis, 4,050,003, Cl. 320-2.000.

Burdorf, Donald L.; and Bjordahl, James, to BASF Aktiengesellschaft. Method and apparatus for generating constant tape tension in a tape transport apparatus. 4,049,216, Cl. 242-192.000.

Burgess, George M.: *See—*
Brush, John D., Jr.; and Burgess, George M., 4,048,926, Cl. 109-65.000.

Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., to Dow Chemical Company, The. 2-Chloro-3-((4-(2,2-dichloro-1,1-difluoroethoxy)phenyl)sulfonyl)propanenitrile. 4,049,693, Cl. 260-465.00F.

Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., to Dow Chemical Company, The. 3-(4-(((Trichloroethenyl)thio)phenyl)sulfonyl)-2-propenenitrile. 4,049,694, Cl. 260-465.00G.

Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., to Dow Chemical Company, The. 3-((3-Trifluoromethyl)phenyl)sulfonyl)-2-propenenitrile. 4,049,695, Cl. 260-465.00G.

Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., to Dow Chemical Company, The. 3-((4-(2,2-Dichloro-1,1-difluoroethoxy)-phenyl)sulfonyl)-2-propenenitrile. 4,049,696, Cl. 260-465.00F.

Burks, Howard L., to Perino B. Wingfield, a part interest. Vending machine with tiered turn table construction. 4,049,154, Cl. 221-76.000.

Burns, Donald A.; Brand, Michael J.; and Saunders, Alexander M., to Technicon Instruments Corporation. Apparatus and method of fluid sample analysis. 4,049,381, Cl. 23-230.00R.

Burris Industries, Inc.: *See—*
Grachten, Erich, 4,049,368, Cl. 425-502.000.

Burrous, Merwyn L., to Chevron Research Company. Jet engine oils containing extreme pressure additive. 4,049,563, Cl. 252-49.900.

Burton, C. Shepherd; Harker, Alan B.; and Ho, William W., to Rockwell International Corporation. Method of detecting gaseous contaminants. 4,049,383, Cl. 23-232.00E.

Burton, Claudia J., to Special Metals Corporation. Refining nickel base superalloys. 4,049,470, Cl. 148-3.000.

Buryagin, Firs Alexandrovich: *See—*
Pomeschikov, Andrei Grigorievich; Buryagin, Firs Alexandrovich; Kazantsev, Lev Seliverstovich; Skvortsov, Gennady Fedorovich; Naryshkin, Jury Anatolievich; and Gracheva, Zinaida Ivanovna, 4,049,901, Cl. 13-9.0ES.

Buss, David R., to Upjohn Company, The. Process for the production of purified camphorsulfonic acid salts. 4,049,703, Cl. 260-503.000.

Bussard, Charles B., to Monarch Marking Systems, Inc. Tag attaching apparatus. 4,049,177, Cl. 227-67.000.

Butler, Gary: *See—*
Irwin, George; and Butler, Gary, 4,049,303, Cl. 292-307.00R.

Butler, Gordon C.: *See—*
Simpson, George R.; Gundlach, Robert W.; and Butler, Gordon C., 4,049,344, Cl. 355-10.000.

Byers, James Otto, Jr., to Tomco, Inc. Pressure compensating fluid control valve. 4,049,232, Cl. 251-30.000.

Byrne, John A.; Rhea, Charles K., Jr.; and Fleming, Thomas F., to Universal Identification Systems, Inc. Animal food consumption monitor. 4,049,950, Cl. 235-61.60R.

C. van der Lely N. V.: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,049,061, Cl. 172-49.000.

Cagle, William A. Adjustable open end wrench. 4,048,876, Cl. 81-165.000.

Calato, Joseph D.; and Calato, Joseph S. Drum beater. 4,048,896, Cl. 84-422.00R.

Calato, Joseph S.: *See—*
Calato, Joseph D.; and Calato, Joseph S., 4,048,896, Cl. 84-422.00R.

Calderon, Nissim: *See—*
Scott, Kenneth W.; and Calderon, Nissim, 4,049,616, Cl. 260-42.320.

Camber International (England) Limited: *See—*
Scarffe, Michael, 4,048,816, Cl. 66-50.00R.

Cambridge Instrument Company, Inc.: *See—*
Fawcett, Howard N., 4,050,002, Cl. 318-661.000.
Pegnim, Timothy C.; France, Larry R.; Sherman, John G.; and MacQuignon, Claude, 4,050,079, Cl. 346-145.000.

Campbell Taggart, Inc.: *See—*
Harris, Hal; and Foreman, Joseph S., Jr., 4,049,955, Cl. 235-152.000.

Canada Square Management Limited: *See—*
Moog, Gerhard W.; and Cooper, Kenneth R., 4,049,045, Cl. 165-12.000.

Cancilla, Philip S. Hydraulic jack having rotating pump handle. 4,048,800, Cl. 60-477.000.

Canon Kabushiki Kaisha: *See—*
Schulz, Hansrichard, 4,049,960, Cl. 250-201.000.

Capper, Ronald. Combination hand truck and garden cart. 4,049,284, Cl. 280-47.180.

Caputi, Alfred A. Holder for shoe polish containers. 4,049,306, Cl. 294-34.000.

Card & Co. Inc.: *See—*
Card, Roy T., 4,048,930, Cl. 112-79.00A.

Card, Roy T., to Card & Co. Inc. Method and apparatus for forming J-tuft pile. 4,048,930, Cl. 112-79.00A.

Carlsson, Ernest R., Jr.; Delach, Henry; and Hinz, Henry, to Ideal Toy Corporation. Bubble free die agitator. 4,049,277, Cl. 273-145.00C.

Caron, John L.: *See—*
Kavanagh, George; and Caron, John L., 4,049,068, Cl. 177-25.000.

Carpenter, Erwin D. Ditch digging apparatus. 4,048,734, Cl. 37-98.000.

Carpenter Technology Corporation: *See—*
Myers, Lewis P., 4,049,430, Cl. 75-124.000.

Carroll, Frank E., to Carroll Research, Inc. Building deck structure. 4,048,777, Cl. 52-309.120.

Carroll Research, Inc.: *See—*
Carroll, Frank E., 4,048,777, Cl. 52-309.120.

Carson, Eunice. Pour spout construction. 4,049,157, Cl. 222-81.000.

Cartner, Jack O. Mower attachment for tractors. 4,048,789, Cl. 56-11.900.
Carvalho, Rocky: *See—*
Horvath, Peter J., 4,049,545, Cl. 210-28.000.
Casady, Fern: *See—*
Stevens, Henry H., 4,048,873, Cl. 81-3.00R.
Casaire Limited: *See—*
Simmons, Robert Sidney, 4,048,809, Cl. 62-89.000.
Casey, James H.; Larson, Curtis Lee; and Brown, Robert Campbell, to Minnesota Mining and Manufacturing Company. System for inflation and sealing of air cushions. 4,049,854, Cl. 428-72.000.
Cassano, James R.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,049,255, Cl. 271-3.000.
Castleman, Howard H.; and Stewart, Henry G., to Package Products Company, Inc. Laminated composite sheet packaging material. 4,048,736, Cl. 40-2.00R.
Castonguay, Roger A.: *See—*
Wenckus, Joseph F.; Menashi, Wilson P.; and Castonguay, Roger A., 4,049,384, Cl. 23-273.0SP.
Catalyst Research Corporation: *See—*
Schneider, Alan A., 4,049,890, Cl. 429-181.000.
Catalytic Generators, Inc.: *See—*
Freebairn, Hugh T., 4,049,837, Cl. 426-308.000.
Caterpillar France S.A.: *See—*
Isnard, Theophile, 4,050,010, Cl. 324-34.00R.
Caterpillar Tractor Co.: *See—*
Engel, William K., 4,048,907, Cl. 91-492.000.
Golan, Kenneth F.; and Winzeler, James E., 4,048,799, Cl. 60-413.000.
Goloff, Alexander; and Keske, Frank E., 4,049,327, Cl. 308-161.000.
Oldenburg, Dorrance; and Fischer, Robert L., 4,049,032, Cl. 144-2.00Z.
Stedman, Robert N., 4,049,071, Cl. 180-24.050.
Stedman, Robert N., 4,049,079, Cl. 182-2.000.
Stedman, Robert N., 4,049,139, Cl. 214-138.00R.
Catherall, Reginald, to Bell & Howell Limited. Pressure responsive apparatus. 4,048,846, Cl. 73-67.200.
Catuma Pty. Limited: *See—*
Lapinski, Richard, 4,048,743, Cl. 43-17.500.
Caudill, Freddie R.: *See—*
DeRegnaucourt, Robert A.; Hall, John C.; and Caudill, Freddie R., 4,049,320, Cl. 301-13.0SM.
Cavitron Corporation: *See—*
Wuchinich, David G.; and Tarsia, Joseph, 4,049,964, Cl. 250-221.000.
Cayton, Robert J.: *See—*
Hyman, David L.; Cayton, Robert J.; and Rosenquist, Kurt E., 4,049,038, Cl. 160-166.00A.
CBS Inc.: *See—*
Rossi, John P., 4,050,084, Cl. 358-31.000.
Celanese Polymer Specialties Company: *See—*
Masters, John Edward, 4,049,744, Cl. 260-837.00R.
Centre d'Etudes Experimentales et Cliniques de Physio Biologie de Pharmacologie et d'Eutonologie: *See—*
Laborit, Henri, 4,049,795, Cl. 424-180.000.
Cermak, Eduard. Electro-pneumatic emergency brake control system for a vehicle train. 4,049,324, Cl. 303-7.000.
Cerra, Raffaele; and Scherillo, Michele. Device for frequency discrimination of electrical signals. 4,050,026, Cl. 328-167.000.
Chabardes, Pierre; Julia, Marc; and Menet, Albert, to Rhone-Poulenc, S.A. Sulphones. 4,049,718, Cl. 260-590.00C.
Chacour, Selim A., to Allis-Chalmers Corporation. Runner seals for hydraulic turbines. 4,049,361, Cl. 415-170.00A.
Chalabian, Jack S., to K-Jack Engineering Company, Inc. Vending machine mechanism housing and armor protection therefor. 4,049,106, Cl. 194-1.00B.
Chambers, William A.; Bossler, Franklin B.; and Brandkamp, Warren F., to Textron Inc. Optical system for lasers. 4,050,036, Cl. 331-94.50C.
Champion International Corporation: *See—*
Cottrell, Edward D., 4,048,761, Cl. 51-138.000.
Frazier, Robert Doyal, 4,049,023, Cl. 139-339.000.
Lare, Donald W., 4,049,492, Cl. 162-146.000.
Lare, Donald W., 4,049,493, Cl. 162-157.00R.
Chandler, Leon, to Cortland Line Company. Fly fishing line. 4,048,744, Cl. 43-17.500.
Chang, Charles: *See—*
Wen, Lian-Tong, 4,049,218, Cl. 244-23.00C.
Chang, Tao-Yuan; and Lin, Chinlon, to Bell Telephone Laboratories, Incorporated. Submillimeter wave and far infrared molecular lasers and polyatomic buffer gases therefor. 4,050,033, Cl. 331-94.50G.
Chardon Laboratories, Inc.: *See—*
Hood, Charles B., 4,049,156, Cl. 222-54.000.
Chas. S. Tanner Co.: *See—*
Lindemann, Martin K., 4,049,862, Cl. 428-253.000.
Chasen, Lee Richard; and Einhorn, Ruediger, to Coats & Clark, Inc. Mounting bracket having hinged base. 4,049,225, Cl. 248-219.400.
Chattem Drug & Chemical Company: *See—*
Bailey, Wesley T., 4,049,748, Cl. 260-861.000.
Chatterji, Arun K. Photoconductors for electrostatic imaging systems. 4,049,505, Cl. 204-38.00R.
Chemetron Corporation: *See—*
George, Henry Howard; and Billings, Ronald Joseph, 4,049,356, Cl. 403-173.000.
Chen, Nai Y.: *See—*
Reagan, William J.; and Chen, Nai Y., 4,049,578, Cl. 252-455.00R.
Chen, Nai Yuen; and Reagan, William Joseph, to Mobil Oil Corporation. Use of elemental oxygen to inhibit election of antimony from an antimony-ZSM-5 catalyst. 4,049,735, Cl. 260-668.00R.
Chen, Tiyung. Space-saving folding bed. 4,048,683, Cl. 5-180.000.
Chenevard, Alexis, to SAPAL Societe Anonyme des Plieuses Automatiques. Method and apparatus for placing objects into boxes. 4,048,780, Cl. 53-26.000.
Chesnick, John C. Arm guard for archers. 4,048,674, Cl. 2-16.000.
Chevallier, George Edward: *See—*
Todd, John Arnold; and Chevallier, George Edward, 4,049,159, Cl. 222-144.500.
Chevron Research Company: *See—*
Burrous, Merwyn L., 4,049,563, Cl. 252-49.900.
Edwards, Leroy H., 4,049,421, Cl. 71-90.000.
Gibson, Kirk R.; Hughes, Thomas R.; and Jacobson, Robert L., 4,049,542, Cl. 208-213.000.
Hodgson, Clive, 4,049,778, Cl. 423-265.000.
Hotten, Bruce W., 4,049,561, Cl. 252-46.700.
Hotten, Bruce W., 4,049,562, Cl. 252-46.700.
Magee, Philip S., 4,049,679, Cl. 260-402.500.
Shrum, Sidney J., 4,048,945, Cl. 114-294.000.
Chiang, John S., to FMC Corporation. Process of preparing peroxymonosulfate. 4,049,786, Cl. 423-513.000.
Chichkov, Jury Viktorovich: *See—*
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.
Chieger, George, to Fruehauf Corporation. Aluminum platform trailer. 4,049,285, Cl. 280-106.00T.
Childress, David L.; Hayes, William V.; and Poppe, Richard L., to Dow Chemical Company, The. Catalyst for making acrolein. 4,049,577, Cl. 252-443.000.
Chillino, Joseph. Inflatable cover for a swimming pool. 4,048,678, Cl. 4-172.120.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt: *See—*
Schawartz, Jozsef; Hornyak, Maria; Majorszki, Eva; David, Agoston; and Horvath, Gabor, 4,049,639, Cl. 260-140.000.
Chiodo, Daniel J.; and Alvarez, Charles S. Rotation-preventing lock assembly. 4,048,741, Cl. 42-1.0LP.
Chiyoda Chemical Engineering & Construction Co. Ltd.: *See—*
Nakagawa, Tetsuo; Matsuda, Nobuo; Mitani, Kazumitsu; and Tanemoto, Toshiharu, 4,049,541, Cl. 208-127.000.
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.
Chr. Hausler AG: *See—*
Elsener, Fritz, 4,048,830, Cl. 72-175.000.
Chramiec, Mark A.: *See—*
Backman, William R., Jr.; and Chramiec, Mark A., 4,050,057, Cl. 340-3.00F.
Chrenko, Richard M.: *See—*
Hanneman, Rodney E.; Chrenko, Richard M.; and Kittle, Donald B., 4,049,186, Cl. 228-225.000.
Christon, Robert H. Turntable support structure for radius mills and the like. 4,048,759, Cl. 51-97.00R.
Chrysler Corporation: *See—*
Crall, Frederick William; and Tomczak, Lawrence William, 4,050,093, Cl. 361-383.000.
Hurst, John W., 4,049,102, Cl. 192-93.00R.
Kissel, William Ronald, 4,048,964, Cl. 123-32.0ED.
Chu, Nori Y. C.; and Piusz, Peter G., to American Optical Corporation. Silver halide activated photochromic plastics. 4,049,567, Cl. 252-300.000.
Chu, Pak-Jong; and Audette, Jacques Marcel, to Northern Telecom Limited. Pushbutton dials. 4,049,924, Cl. 179-90.00R.
Chu, Simon L.; and Golda, Eugene, to Polychrome Corporation. Method of producing lithographic printing plates. 4,049,504, Cl. 204-38.00A.
Chubb, Raymond L.; Haven, Lawrence F.; and Hisey, Robert W., to Gardner-Denver Company. Multi function drill drive system. 4,049,064, Cl. 173-147.000.
Chubb, Wayne L., to Faircraft Engineering, Inc. Attache case and the like. 4,049,091, Cl. 190-18.00R.
Church, John Allen; Feinstein, Paul, Jr.; Hunt, Ronald Eugene; McDaniels, Louis Marion; and Munch, Paul Francis, to International Business Machines Corporation. Document alignment assembly. 4,049,256, Cl. 271-9.000.
Churillo, Charles J.: *See—*
Lock, William E.; and Churillo, Charles J., 4,048,900, Cl. 86-48.000.
Ciba-Geigy AG: *See—*
Hindermann, Peter; and Meindl, Hubert, 4,049,656, Cl. 260-256.50R.
Seiler, Herbert; and Dussy, Paul, 4,049,661, Cl. 260-256.40N.
Ciba-Geigy Corporation: *See—*
Elsener, Anton; Gehrt, Hans Harald; Medinger, Bernhard; and Wiese, Volkhard, 4,049,615, Cl. 260-39.00P.
Holt, Brian; and Randell, Donald Richard, 4,049,647, Cl. 542-426.000.
Jaeggi, Knut A.; Schroter, Herbert; and Ostermayer, Franz, 4,049,797, Cl. 424-180.000.
Kray, Raymond J., 4,049,711, Cl. 260-551.00C.

Spivack, John D., 4,049,654, Cl. 544-221.000.
Spivack, John D., 4,049,713, Cl. 260-559.00R.
Cincinnati Milacron Inc.: *See*—
Cox, Joseph Henry, 4,048,879, Cl. 82-28.00R.
Clark, Donald W.: *See*—
Jaco, Charles M., Jr.; Menear, Wallace C.; and Clark, Donald W., 4,049,441, Cl. 75-35.000.
Claudius Peters AG: *See*—
Stamer, Walter; and Eichinger, Frithjof, 4,049,247, Cl. 266-182.000.
Cleary, James W., to Phillips Petroleum Company. Production of tetramethylene terephthalate polymers using 225° to 248° C. polycondensation temperature. 4,049,635, Cl. 260-75.00R.
Clerbois, Lucien; Degueldre, Louis; Biver, Christian; Degols, Albert; and Gobillon, Yves, to Solvay & Cie. Electrodes for electrochemical processes. 4,049,532, Cl. 204-290.00F.
Clingan, Andrew J. Minnow dipper with automatic partitioning access door. 4,048,742, Cl. 43-4.000.
Clorfeine, Alvin Seymour, to RCA Corporation. Bi-static radar speed sensor. 4,050,071, Cl. 343-8.000.
Coats & Clark, Inc.: *See*—
Chasen, Lee Richard; and Einhorn, Ruediger, 4,049,225, Cl. 248-219.400.
Cocozza, Eugene P., to Wehran Engineering Corporation. Chemical fixation of desulfurization residues. 4,049,462, Cl. 106-85.000.
Coffey, D. A. Combined dust pan and broom holder. 4,048,692, Cl. 15-257.200.
Cogan, Scott Douglas. Boxcell core and panel. 4,049,855, Cl. 428-116.000.
Cohen, David J. Heating and cooling system consumption meter. 4,049,044, Cl. 165-11.000.
Cohen, Louis, to Delco Chemical Company, Inc. Prolonged acting appetite suppressant and anti-obesity compositions containing amphetamine adipate, dextroamphetamine adipate, amphetamine sulfate and dextroamphetamine sulfate as the active agents. 4,049,791, Cl. 424-20.000.
Cohen, Paul B., to United States of America, Air Force. Elliptical, interdigital transducer. 4,049,982, Cl. 310-366.000.
Coker, Thomas G.; and Argade, Shyam D., to BASF Wyandotte Corporation. Sprayed cathodes. 4,049,841, Cl. 427-34.000.
Colaco, Stephen Francis, to Ferranti Limited. Transistor circuits. 4,049,975, Cl. 307-213.000.
Cole, Larry K. Insecticidal and insect-repellant methods and compositions. 4,049,828, Cl. 424-333.000.
Cole, Leon J.; and Tolan, John R., to Milliken Research Corporation. Tension equalizer. 4,049,168, Cl. 226-40.000.
Coles, Donald K. Electronic musical instrument. 4,048,893, Cl. 84-1.010.
Colgate-Palmolive Company: *See*—
Douglass, Miriam Lois, 4,049,665, Cl. 260-294.80J.
Rasmussen, Hjorth, 4,049,558, Cl. 252-8.900.
Wixon, Harold Eugene, 4,049,557, Cl. 252-8.800.
Collet, Paul, to Rhone-Poulenc Industries. Compositions based on polyamines with ether groups. 4,049,716, Cl. 260-573.000.
Collier, Everett J., to Procter & Gamble Company, The. Builder system and detergent product. 4,049,586, Cl. 252-532.000.
Collins, Floyd K., to GTE Sylvania Incorporated. CRT in-line gun electrode having strengthening ribs. 4,049,990, Cl. 313-417.000.
Collins, Floyd K., to GTE Sylvania Incorporated. Longitudinal rib embossment in tri-apertured, substantially planar electrode. 4,049,991, Cl. 313-417.000.
Columbia Chemical Corporation: *See*—
Rosenberg, William E., 4,049,510, Cl. 204-55.00R.
Columbia Ribbon & Carbon Mfg. Co., Inc.: *See*—
Peterson, Glenn E.; Emerson, Robert T.; and Schoenlein, William J., 4,048,952, Cl. 118-6.000.
Combustion Engineering, Inc.: *See*—
Prible, Glen Virgil, 4,049,371, Cl. 432-234.000.
Combustion Research Corporation: *See*—
Johnson, Arthur C. W., 4,049,404, Cl. 55-387.000.
Cominco Ltd.: *See*—
Swinkels, Godefridus Maria; Furber, Robert Arthur; Milner, Edward Francis Godfrey; Genik-Sas-Berezowsky, Roman Michael; and Kirby, Charles Ray, 4,049,770, Cl. 423-37.000.
Commer S.r.l.: *See*—
Verbeek, Francois; Bulten, Eric J.; and van den Hurk, Jan W. G., 4,049,689, Cl. 260-429.700.
Commissariat a l'Energie Atomique: *See*—
Da Costa Vieira, David; Dufayet, Jean-Pierre; and Lemaire, Maurice, 4,049,954, Cl. 235-151.320.
Hatterer, Andre; Oberlin, Claude; and Strobel, Pierre, 4,049,443, Cl. 75-66.000.
Commonwealth Scientific and Industrial Research Organization: *See*—
Evans, John James Alexander; and Holan, George, 4,049,815, Cl. 424-269.000.
Compagnie Francaise des Petroles: *See*—
Corgnet, Jean Louis, 4,048,944, Cl. 114-293.000.
Compagnie Generale d'Electricite S.A.: *See*—
Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, 4,049,884, Cl. 429-104.000.
Condes Corporation: *See*—
Martin, Thomas R., 4,048,915, Cl. 101-35.000.
Connors, Daniel F.: *See*—
Bennett, R. Jackson; and Connors, Daniel F., 4,049,400, Cl. 55-139.000.
Conrad, Donald W. Quick shut-off direct reading liquid level indicator. 4,048,856, Cl. 73-324.000.
Conrow, Ransom Brown; Bernstein, Seymour; and Bauman, Norman, to American Cyanamid Company. Substituted bisnaphthylazo diphenyl ureido complement inhibitors. 4,049,640, Cl. 260-175.000.
Container Corporation of America: *See*—
Bell, John T., 4,049,130, Cl. 214-8.50A.
Conval-Penn, Inc.: *See*—
Deem, Howard H., 4,048,709, Cl. 29-527.600.
Convertini, Ursula; Dimigen, Heinz; and Luthje, Holger, to U.S. Philips Corporation. Cathode sputtering method for the manufacture of etched structures. 4,049,521, Cl. 204-192.00E.
Cooper, David J.; Gebhardt, George W.; Valenta, Joseph R.; and Wdzieczkowski, Francis E., to SmithKline Corporation. Automatic fraction collector. 4,049,031, Cl. 141-284.000.
Cooper, David J.; Waitz, Jay Allan; Counelis, Mae; and Weinstein, Jay, to Schering Corporation. Amino glycoside antibiotics having antibacterial activity. 4,049,796, Cl. 424-180.000.
Cooper, Kenneth R.: *See*—
Moog, Gerhard W.; and Cooper, Kenneth R., 4,049,045, Cl. 165-12.000.
Cope, Kenneth, to Neff Folding Box Company. Bottle and glass carrier. 4,049,116, Cl. 206-176.000.
Cope, William M.: *See*—
Lillard, Richard E.; and Cope, William M., 4,049,092, Cl. 191-40.000.
Copperi, Maurizio; and Nebbia, Luciano, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. PCM telecommunication system with merger of two bit streams along a common signal path. 4,049,917, Cl. 179-15.0AP.
Coppolani, Joseph; and Vandernotte, Leon, to Societe Franco-Europeenne de Material pour l'Industrie Alimentaire "F.E.M.I.A" France. Sorting machine for elongated articles. 4,049,124, Cl. 209-98.000.
Cordes, Claus: *See*—
Doerfel, Helmut; and Cordes, Claus, 4,049,638, Cl. 260-78.00L.
Corgnet, Jean Louis, to Compagnie Francaise des Petroles. Interconnection of a floating structure and a submerged anchor station. 4,048,944, Cl. 114-293.000.
Cormier, Yves. Photocopying apparatus. 4,049,348, Cl. 355-50.000.
Corn, John E., Jr.; and Klopfer, Howard J., to General Electric Company. Purification of crude 9,9-bis-(4-hydroxyphenyl)-fluorene. 4,049,721, Cl. 260-619.00A.
Corning Glass Works: *See*—
Lepp, Cyrus A.; Mason, Robert D.; and Ramsey, William S., 4,049,499, Cl. 195-100.000.
Smith, Roy E., 4,049,414, Cl. 65-4.00B.
Zine, Anthony R., Jr., 4,049,692, Cl. 260-448.20B.
Cortland Line Company: *See*—
Chandler, Leon, 4,048,744, Cl. 43-17.500.
Cottell, Eric Charles. Combustion method comprising burning an intimate emulsion of fuel and water. 4,048,963, Cl. 123-25.00R.
Cotton, Charles C.; and Jencks, Guy S. D., to United States of America, Navy. Helicopter towline recovery buoy system. 4,048,942, Cl. 114-253.000.
Cottrell, Edward D., to Champion International Corporation. Paper stick pointing apparatus. 4,048,761, Cl. 51-138.000.
Cotty, Val F.; Sterbenz, Francis J.; and Melman, Kenneth J., to Bristol-Myers Company. Augmentation of blood levels of aspirin. 4,049,803, Cl. 424-233.000.
Coucher, Robert G.: *See*—
Gerek, Gene; and Coucher, Robert G., 4,049,842, Cl. 427-34.000.
Coulter Information Systems, Inc.: *See*—
Kuehnle, Manfred R., 4,049,963, Cl. 250-211.00R.
Counelis, Mae: *See*—
Cooper, David J.; Waitz, Jay Allan; Counelis, Mae; and Weinstein, Jay, 4,049,796, Cl. 424-180.000.
Coutant, Ralph W., to Litton Systems, Inc. Keeper for idler rolls. 4,048,707, Cl. 29-509.000.
Cox, Joseph Henry, to Cincinnati Milacron Inc. Stock sensing device. 4,048,879, Cl. 82-28.00R.
CPC International Inc.: *See*—
Walon, Raoul Guillaume Phillipe, 4,049,466, Cl. 127-29.000.
Crall, Frederick William; and Tomczak, Lawrence William, to Chrysler Corporation. Housing for mounting electronic circuit boards on an engine air intake structure. 4,050,093, Cl. 361-383.000.
Crandon, Harry D.: *See*—
Laurin, Bernard L.; Rotenberg, Don H.; and Crandon, Harry D., 4,049,868, Cl. 428-412.000.
Creasey, Norman Geoffrey; and Pike, Leslie Clark, to Imperial Chemical Industries Limited. Surface treating compositions. 4,049,873, Cl. 428-447.000.
Criger, Glenn L.: *See*—
Roden, William A.; and Criger, Glenn L., 4,049,183, Cl. 228-50.000.
Crocker, Thomas H.; Levitt, Barry N.; and Suprenant, Paul J., to United States of America, Air Force. System for digitizing and interfacing analog data for a digital computer. 4,050,062, Cl. 340-183.000.
Crouch, Ivan Percy, to USM Corporation. Control mechanism for edge folding machines. 4,048,688, Cl. 12-55.100.
Crowdy, Edmund Porter; and Drentham-Susman, Hector Fillippus Alexander, to Hawthorn Leslie (Engineers) Limited. Turbo-alternator plant. 4,049,972, Cl. 290-52.000.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Copperi, Maurizio; and Nebbia, Luciano, 4,049,917, Cl. 179-15.0AP.
Van Veen, Wouter Martinus Dirk, 4,049,956, Cl. 235-153.0AC.
Cueman, Glenn F., to Zimmer U.S.A., Inc. Therapeutic stocking and method. 4,048,818, Cl. 66-172.00E.

Cunningham, Jere P., Jr. User-actuated simulated motorcycle ride. 4,049,262, Cl. 272-1.00R.

Cunningham, Sinclair Upton: *See—*
Firth, Donald; and Cunningham, Sinclair Upton, 4,048,906, Cl. 91-491.000.

Cutler-Hammer, Inc.: *See—*
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,050,083, Cl. 357-28.000.
Wilson, Chester K., 4,050,046, Cl. 337-319.000.

Da Costa Vieira, David; Dufayet, Jean-Pierre; and Lemaire, Maurice, to Commissariat a l'Energie Atomique. Device for accurate measurement of the dimensions of an object by ultrasonic waves. 4,049,954, Cl. 235-151.320.

Dainippon Screen Seizo Kabushiki-Kaisha: *See—*
Tanabe, Osamu; Nishizawa, Hisao; and Hata, Kazuo, 4,049,345, Cl. 355-41.000.

Dalton, Augustine I., Jr., to Air Products and Chemicals, Inc. Selective oxidation of chrysanthemyl alcohol. 4,049,706, Cl. 260-514.00H.

D'Amico, John J., to Monsanto Company. Use of benzothiazoline compounds as plant growth regulants. 4,049,419, Cl. 71-76.000.

Damon, James William. Combination photographing and prompting systems. 4,049,907, Cl. 358-185.000.

Danforth Agri-Resources: *See—*
Barnidge, Thomas O.; and Hasty, Russell D., 4,048,960, Cl. 119-28.000.

Danguillier, Wilhelm: *See—*
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,049,394, Cl. 48-62.00R.
Gernhardt, Paul; Grams, Wolfgang; Pohl, Siegfried; and Danguillier, Wilhelm, 4,049,570, Cl. 252-373.000.

Danheisser, Hans, to Immco Industries, Inc. Convertible carton. 4,049,114, Cl. 206-44.00B.

Daniels, Peter John Lovell: *See—*
Weinstein, Marvin Joseph; Daniels, Peter John Lovell; Wagman, Gerald Howard; and Testa, Raymond Thomas, 4,049,498, Cl. 195-96.000.

Danner, Dean Wilson, to GTE Automatic Electric Laboratories Incorporated. Remote access for centrally located answering and recording equipment. 4,049,915, Cl. 179-6.00C.

Danner, Dean Wilson, to GTE Automatic Electric Laboratories Incorporated. Ring detector circuit for centrally located answering and recording equipment. 4,049,916, Cl. 179-6.00C.

Dantzer, Peter H.; and Tatay, Charles L., to Intercontinental Plastics Mfg. Co. Closure lid assembly for protective housings. 4,048,766, Cl. 52-19.000.

Dart Industries Inc.: *See—*
Scardiglia, Frank; and Kiss, Kornel Dezso, 4,049,751, Cl. 260-876.00R.

Dartois, Jean-Pierre Andre, to International Standard Electric Corporation. Switching network employing an improved interconnection. 4,049,923, Cl. 179-18.0GE.

Dashevsky, Zinovy Moiseevich: *See—*
Kolomoets, Nikolai Vasilievich; Dashevsky, Zinovy Moiseevich; Granovsky, Vladimir Isaakovich; Shmidt, Igor Aronovich; and Gelfgat, David Mendelevich, 4,049,469, Cl. 136-225.000.

Dastrup, John Burke; and Green, Paul Oscar. Coil re-bar straightener and cutter. 4,048,825, Cl. 72-12.000.

David, Agoston: *See—*
Schawartz, Jozsef; Hornyak, Maria; Majorszki, Eva; David, Agoston; and Horvath, Gabor, 4,049,639, Cl. 260-140.000.

Davies, Thomas Roderick Harries: *See—*
Beveridge, John; Davies, Thomas Roderick Harries; Fidler, Fred; and Ring, Maurice Frank, 4,048,935, Cl. 113-120.00F.

Davis, Charles J.: *See—*
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,049,491, Cl. 162-101.000.

Davis, George B., Jr. Pie crust, dough and package. 4,049,836, Cl. 426-112.000.

Davis, Raymond L., II; and Beck, Robert I., to Airco, Inc. Methods for carburizing steel parts. 4,049,473, Cl. 148-16.500.

Davis, William P., to L G Industries, Incorporated. Torque control devices of the viscous shear type and components therefor. 4,049,100, Cl. 192-58.00C.

Davy Powergas GmbH: *See—*
Furkert, Herbert, 4,049,646, Cl. 260-239.30A.

Daymond Limited: *See—*
Reid, Robert, 4,049,082, Cl. 200-217.000.

Dayton-Walther Corporation: *See—*
DeRegnaucourt, Robert A.; Hall, John C.; and Caudill, Freddie R., 4,049,320, Cl. 301-13.0SM.

Dean, Roy Delmar; and Weiland, Richard Herschel, to Boeing Company, The. Variable pivot trailing edge flap. 4,049,219, Cl. 244-217.000.

De Angelo, Gerald J., to Zinsco Electrical Products. Magnetic trip assembly. 4,050,039, Cl. 335-38.000.

Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, to Philagro. Phosphite compounds as fungicidal agents. 4,049,801, Cl. 424-217.000.

Decca Limited: *See—*
Baty, Charlton Robert; and Jarvis, Alfred John, 4,049,951, Cl. 235-92.0FP.

Decker, Karl. Fifth wheel attachment. 4,049,146, Cl. 214-620.000.

Deckrow, Rodger E. Composite automotive vehicle, components thereof, and a method of constructing and using the same. 4,049,289, Cl. 280-423.00R.

DeCrane, Charles E.: *See—*
Harris, Thomas C.; and DeCrane, Charles E., 4,049,028, Cl. 141-10.000.

Deem, Howard H., to Conval-Penn, Inc. Method of casting. 4,048,709, Cl. 29-527.600.

Deflandre, Rene. Balancing and compensating arrangement. 4,048,902, Cl. 90-11.00F.

Degols, Albert: *See—*
Clerbois, Lucien; Degueldre, Louis; Biver, Christian; Degols, Albert; and Gobillon, Yves, 4,049,532, Cl. 204-290.00F.

Degueldre, Louis: *See—*
Clerbois, Lucien; Degueldre, Louis; Biver, Christian; Degols, Albert; and Gobillon, Yves, 4,049,532, Cl. 204-290.00F.

Delach, Henry: *See—*
Carlsson, Ernest R., Jr.; Delach, Henry; and Hinz, Henry, 4,049,277, Cl. 273-145.00C.

Delalande S.A.: *See—*
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,658, Cl. 260-268.0PC.
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,660, Cl. 260-268.0PC.

Delco Chemical Company, Inc.: *See—*
Cohen, Louis, 4,049,791, Cl. 424-20.000.

Delehouzee, Leon: *See—*
Blanpain, Jacques; and Delehouzee, Leon, 4,048,705, Cl. 29-420.000.

Del Fabro, Remigio. Bending apparatus having a shaped mandrel used in automatic bending machines for metal wire and bar stock. 4,049,026, Cl. 140-105.000.

De Long, Charles F., to United States Trading International, Inc. Method for preserving porous inorganic substrates. 4,049,869, Cl. 428-413.000.

de Meester, Emiel Petrus Juliaan: *See—*
Verstegen, Judicus Marinus Pieter Jan; van de Spijker, Willebrordus Hubertus Martinus Maria; and de Meester, Emiel Petrus Juliaan, 4,049,992, Cl. 313-486.000.

Demidov, Alek Platonovich: *See—*
Golyanov, Vyacheslav Mikhailovich; and Demidov, Alek Platonovich, 4,049,533, Cl. 204-298.000.

Denisovich, Vasily Alexeevich: *See—*
Zaplatin, Veniamin Petrovich; Svitelsky, Vasily Petrovich; Galov, Lev Ivanovich; Djukareva, Alla Konstantinovna; Sklyar, Rozalia Grigorievna; Denisovich, Vasily Alexeevich; Shirokov, Dmitry Alexeevich; and Shevchenko, Vladimir Alexandrovich, 4,049,490, Cl. 162-37.000.

Dennis, James T. Automatic record changer. 4,049,278, Cl. 274-10.00R.

Dent, Joseph B., Jr.; Martin, Walter L., Jr.; and Bennett, Howard M., to PPG Industries, Inc. Method and apparatus for forming glass fibers. 4,049,412, Cl. 65-2.000.

Dent, Joseph B., Jr., to PPG Industries, Inc. Apparatus for forming glass fibers. 4,049,415, Cl. 65-11.00W.

Dent, Joseph B., Jr.: *See—*
Long, David M.; and Dent, Joseph B., Jr., 4,049,411, Cl. 65-2.000.

Deprez, Jacques: *See—*
Becker, Wolf-Jurgen; Breuer, Wolfram; and Deprez, Jacques, 4,049,503, Cl. 204-1.00T.

DeRegnaucourt, Robert A.; Hall, John C.; and Caudill, Freddie R., to Dayton-Walther Corporation. Vehicle wheels, spacers and dual rims. 4,049,320, Cl. 301-13.0SM.

Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, to Hoffman-La Roche Inc. Tricyclic benzodiazepines. 4,049,666, Cl. 260-294.80R.

Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, to Hoffmann-La Roche Inc. Tricyclic benzodiazepines. 4,049,667, Cl. 260-294.80R.

Derks, Harry G., to Fleetwood Furniture Company. Electrical teaching system. 4,048,729, Cl. 35-8.00A.

de Ronde, Henry Marinus, to Hughes Aircraft Company. Connector for coaxial cables. 4,049,902, Cl. 174-35.00C.

deRosset, Armand J.: *See—*
Neuzil, Richard W.; and deRosset, Armand J., 4,049,688, Cl. 260-428.000.

Desoutter Brothers Limited: *See—*
Webb, George Henry, 4,049,104, Cl. 192-150.000.

Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, to Compagnie Generale d'Electricite S.A. Sodium-sulphur electric cell. 4,049,884, Cl. 429-104.000.

Detectronic Limited: *See—*
Smith, Peter David; and Smith, Keith Hindle, 4,048,853, Cl. 73-194.00A.

Dettmann, Heinrich: *See—*
Lechner, Manfred; Schirm, Volker; and Dettmann, Heinrich, 4,048,826, Cl. 72-21.000.

Diamond Shamrock Corporation: *See—*
Szur, Alex J., 4,049,668, Cl. 260-295.00R.

Dickerson, Richard C. Mobile demineralizer. 4,049,548, Cl. 210-96.00R.

Dickey-john Corporation: *See—*
Marsh, Norman F.; and Kelly, Warren H., 4,050,016, Cl. 324-61.00R.

Didier Engineering GmbH: *See—*
Divivier, Rudolf; and Uckert, Gotthard, 4,049,777, Cl. 423-239.000.

DIEHL: *See—*
Raab, Richard; Spindler, Kurt; Brand, Herbert; and Gast, Leonard, 4,048,832, Cl. 72-255.000.

Diehl, Harry Weldon. Cetyl myristoleate. 4,049,824, Cl. 424-312.000.

Dielman, Harold J., to Sanymetal Products Co., Inc., The. Anchor assembly for pilasters. 4,048,775, Cl. 52-239.000.

Dietrich, Alfred T.; and Galbreath, Gerald W., to Overhead Door Corporation. Bulkhead door. 4,049,311, Cl. 296-24.00R.

Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, to Akademie der Wissenschaften der D D R. Processes for the separation of potassium salts of perfluoroalkanoic acids from aqueous solutions thereof. 4,049,681, Cl. 260-408.000.

Dietrich, William John, to DMI, Inc. Multi-unit adjustable plow system. 4,049,063, Cl. 172-283.000.

Diggens, Albert A.: *See—*
Ross, James W., Jr.; and Diggens, Albert A., 4,049,382, Cl. 23-230.00R.

DIHACO Diamanten Handels Compagnie Est.: *See—*
Bruck, Gernot Klaus, 4,049,350, Cl. 356-30.000.

DiLeo, Christopher C., to Krautkramer-Branson, Incorporated. Attenuator circuit ultrasonic testing. 4,050,055, Cl. 340-1.00R.

Dimigen, Heinz: *See—*
Convertini, Ursula; Dimigen, Heinz; and Luthje, Holger, 4,049,521, Cl. 204-192.00E.

Dimitrov, Dimiter Tanev: *See—*
Nikolov, Ivan Dimov; Kortenski, Hristo Georgiev; Dimitrov, Dimiter Tanev; and Antonov, Asparuh Mihaylov, 4,049,041, Cl. 164-120.000.

Disston, Horace C., Jr., to Van Wood Manufacturing Co., Inc. Tailstock powering device. 4,048,881, Cl. 82-31.000.

Distler, Walter; Zink, Roderich; and Linke, Gerhard, to Siemens Aktiengesellschaft. Tomographic X-ray apparatus for producing tomographic images. 4,049,968, Cl. 250-445.00T.

Dittmar, Heinz: *See—*
Bierbach, Herbert; Dittmar, Heinz; Heinz, Ernst; Hohmann, Klaus; and Rennhack, Rolf, 4,049,788, Cl. 423-592.000.

Dively, Charles R., to Ingersoll-Rand Company. Cutter mounting extension apparatus. 4,049,067, Cl. 175-406.000.

Divivier, Rudolf; and Uckert, Gotthard, to Didier Engineering GmbH. Method of waste gas treatment. 4,049,777, Cl. 423-239.000.

Dixico Inc.: *See—*
Hubert, Warren N., 4,048,933, Cl. 113-1.00B.

Djukareva, Alla Konstantinovna: *See—*
Zaplatin, Veniamin Petrovich; Svitelsky, Vasily Petrovich; Galov, Lev Ivanovich; Djukareva, Alla Konstantinovna; Sklyar, Rozalia Grigorievna; Denisovich, Vasily Alexeevich; Shirokov, Dmitry Alexeevich; and Shevchenko, Vladimir Alexandrovich, 4,049,490, Cl. 162-37.000.

DMI, Inc.: *See—*
Dietrich, William John, 4,049,063, Cl. 172-283.000.

Doble, William A.: *See—*
Ellers, Fred S.; Hally, Hugh G.; McIlveen, Edward E.; and Doble, William A., 4,048,807, Cl. 61-105.000.

Dobritz, Gunter, to Dragerwerk Aktiengesellschaft. Humidity exchanger in an apparatus for respiration and anasthesia. 4,048,993, Cl. 128-212.000.

Dr. C. Otto & Comp. G.m.b.H.: *See—*
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,049,394, Cl. 48-62.00R.
Gernhardt, Paul; Grams, Wolfgang; Pohl, Siegfried; and Danguillier, Wilhelm, 4,049,570, Cl. 252-373.000.

Doerfel, Helmut; and Cordes, Claus, to BASF Aktiengesellschaft. Manufacture of polylactams with initial pressures above vapor pressures of starting materials. 4,049,638, Cl. 260-78.00L.

Doi, Kazumasa: *See—*
Beno, Lawrence A.; and Doi, Kazumasa, 4,050,070, Cl. 343-6.8LC.

Doi, Tetsuo: *See—*
Yamada, Takahiro; and Doi, Tetsuo, 4,050,077, Cl. 346-75.000.

Dolgen, Igor E., to Perkin-Elmer Corporation, The. Movable ladle in a pressurized conduct for transporting specimens to a combustion chamber. 4,049,134, Cl. 214-29.000.

Dominey, Alan Michael, to Exxon Research & Engineering Co. Detergent additives. 4,049,560, Cl. 252-33.300.

Dominguez, Richard J. G., to Shell Oil Company. Block copolymer compositions. 4,049,595, Cl. 260-5.000.

Donachie, Stephen James, to International Nickel Company, Inc., The. Ferritic alloys of low flow stress for P/M forgings. 4,049,429, Cl. 75-246.000.

Dorentruper Sand- und Thonwerke GmbH: *See—*
Florian, Rudolf, 4,049,759, Cl. 264-30.000.

Dost, Nicolaas: *See—*
Middelhoek, Servaas; Santing, Gerhardus; and Dost, Nicolaas, 4,049,425, Cl. 75-135.000.

Douglas, Walter M., to UOP Inc. Catalyst and method of manufacture and use thereof. 4,049,572, Cl. 252-431.00N.

Douglass, Miriam Lois, to Colgate-Palmolive Company. Unsymmetrical disulfides as antimicrobial agents. 4,049,665, Cl. 260-294.80J.

Dow Chemical Company, The: *See—*
Brown, Frederick L., 4,049,849, Cl. 427-325.000.
Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., 4,049,693, Cl. 260-465.00F.
Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., 4,049,694, Cl. 260-465.00G.
Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., 4,049,695, Cl. 260-465.00G.
Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., 4,049,696, Cl. 260-465.00F.
Childress, David L.; Hayes, William V.; and Poppe, Richard L., 4,049,577, Cl. 252-443.000.
Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., 4,049,736, Cl. 260-669.0QZ.
Morehouse, Donald S., Jr.; and Bolton, Frank Harold, deceased, 4,049,604, Cl. 260-29.6RW.
Smith, Hubert Stacy, Jr.; and Hay, Robert A., II, 4,049,852, Cl. 428-55.000.
Strycker, Stanley J., 4,049,814, Cl. 424-267.000.

Downing, James H.; and Bear, Harold F., to Bear Industries, Inc. Reversible and variable speed drive means for conveyors and beaters on a forage wagon. 4,049,145, Cl. 214-519.000.

Draber, Wilfried: *See—*
Timmler, Helmut; Draber, Wilfried; Buchel, Karl Heinz; and Lurssen, Klaus, 4,049,418, Cl. 71-76.000.

Dragerwerk Aktiengesellschaft: *See—*
Dobritz, Gunter, 4,048,993, Cl. 128-212.000.

Drehman, Lewis E.; and Farha, Floyd, Jr., to Phillips Petroleum Company. Selective oxidation of acetylenes. 4,049,743, Cl. 260-681.50R.

Drentham-Susman, Hector Fillippus Alexander: *See—*
Crowdy, Edmund Porter; and Drentham-Susman, Hector Fillippus Alexander, 4,049,972, Cl. 290-52.000.

Dresser Europe S.A.: *See—*
Fruin, Harry James, 4,049,318, Cl. 299-81.000.

Dresser Industries, Inc.: *See—*
Englert, Robert Dixon; and Armstrong, Kenneth Ronald, 4,049,758, Cl. 261-62.000.
Henry, Ralph Eugene, 4,049,016, Cl. 137-498.000.
Nystrom, Walter Albert, 4,048,878, Cl. 81-409.000.
Todd, John Arnold; and Chevallier, George Edward, 4,049,159, Cl. 222-144.500.

Driole, Jean; Allibert, Colette; Bonnier, Etienne; and Wicker, Alain, to Agence Nationale de Valorisation de la Recherche (ANVAR). Process of separation, particularly of a solid phase, from a matrix in liquid phase. 4,049,437, Cl. 75-10.00R.

Dru, Luke William; and Hwang, Yun Sheng, to Western Digital Corporation. MOS high current drive circuit. 4,049,978, Cl. 307-270.000.

Ducret, Jacques Joseph: *See—*
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.

Dudouyt, Jean-Paul. Sail vehicles. 4,049,287, Cl. 280-213.000.

Duenser, William F., to Signode Corporation. Sealless strap end alignment and connection means. 4,048,697, Cl. 24-20.0EE.

Dufayet, Jean-Pierre: *See—*
Da Costa Vieira, David; Dufayet, Jean-Pierre; and Lemaire, Maurice, 4,049,954, Cl. 235-151.320.

Duffy, Robert Donovan: *See—*
Sandner, Michael Ray; and Duffy, Robert Donovan, 4,049,931, Cl. 260-2.5AC.

Dugois, Jean-Pierre: *See—*
Morel, Paul; and Dugois, Jean-Pierre, 4,049,528, Cl. 204-243.00M.

Dulson, John E.: *See—*
Freeman, George M.; Dulson, John E.; and Morris, Monica F., 4,049,514, Cl. 204-119.000.

Dunbar, Glenn G. Scale testing vehicle. 4,048,843, Cl. 73-1.00B.

Dunikowski, Andrzej; Bednarczyk, Jan; Keska, Jerzy; Pisarkiewicz, Tadeusz; and Zamarski, Andrzej. Electric system of meter for measurements of density of mixtures conveyed in a pipeline. 4,048,844, Cl. 73-32.00R.

Dunphy, Gerald Francis: *See—*
Newman, Donald John; and Dunphy, Gerald Francis, 4,048,694, Cl. 16-52.000.

Du Pont de Nemours, E. I., and Company: *See—*
Lauder, Alan, 4,049,583, Cl. 252-466.0PT.
McGhee, John D., 4,049,997, Cl. 318-128.000.
Otto, Kenneth Wayne; and Hatten, Jimmy L., 4,049,729, Cl. 260-654.00H.
Schwing, Gregory Wayne, 4,049,705, Cl. 260-512.00C.
Tocker, Stanley, 4,049,710, Cl. 260-544.00C.
Vassiliou, Eustathios, 4,049,863, Cl. 428-324.000.

Dupraz, Jean: *See—*
Balleys, Francois; and Dupraz, Jean, 4,049,942, Cl. 219-69.00M.

Durant, Graham John; Ganellin, Charon Robin; and White, George Raymond, to Smith Kline & French Laboratories Limited. Process for preparing N-cyanoguanidines. 4,049,671, Cl. 548-342.000.

Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. 4-Methyl-5-imidazolylmethylthioethylamine and -S-methylisothiourea. 4,049,672, Cl. 548-342.000.

Durbin, Charles R.; and Schoenbachler, Bernard W., to General Electric Company. Apparatus for forming serpentine heat exchangers. 4,048,834, Cl. 72-294.000.

Durenec, Peter, to Brener, William; Ball, Edward; and Branan, Floyd, a part interest to each. Freight container universal corner. 4,049,149, Cl. 220-1.500.

Durr-Dental KG: *See—*
Durr, Walter, 4,049,981, Cl. 310-317.000.

Durr, Walter, to Durr-Dental KG. Piezoelectrically driven ultrasonic tool with cooling. 4,049,981, Cl. 310-317.000.

Dussy, Paul: *See—*
Seiler, Herbert; and Dussy, Paul, 4,049,661, Cl. 260-256.40N.

Duthweiler, Frederick C., to Union Oil Company of California. Ice islands and method for forming same. 4,048,808, Cl. 61-103.000.

Dutton, Daniel Ronan; and Musolf, Thomas Carl, to BASF Wyandotte Corporation. Corrosion test cell. 4,049,525, Cl. 204-195.00C.

Dwyer, Francis G.; and Klocke, Donald J., to Mobil Oil Corporation. Propylation of toluene. 4,049,737, Cl. 260-671.00P.
Dwyer, Richard E. Concrete additive and method of applying stucco cement. 4,049,465, Cl. 106-314.000.
Dybas, Richard A.: *See*—
Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,049,559, Cl. 252-8.55D.
Witzel, Bruce E.; Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,049,417, Cl. 71-67.000.
Dybel, Frank R. Load monitoring system. 4,048,848, Cl. 73-88.50R.
Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Heinen, Richard; and Rieger, Georg, 4,048,875, Cl. 81-125.000.
Dye, Joseph R. Electronic rodent exterminator. 4,048,746, Cl. 43-98.000.
Dymat Photomatrix Corporation: *See*—
Hearon, Guy Head, 4,049,342, Cl. 353-27.00R.
Dynamit Nobel Aktiengesellschaft: *See*—
Bockstiegel, Gerd-Edzard; Neidhardt, Manfred; Rehfeld, Gerhard; and Umlauf, Werner, 4,049,397, Cl. 51-309.00A.
Seiler, Claus-Dieter; and Vahlensieck, Hans-Joachim, 4,049,690, Cl. 260-448.20E.
Dzus Fastener Co., Inc.: *See*—
Schenk, Peter, 4,049,301, Cl. 292-113.000.
E-C Apparatus Corporation: *See*—
Posner, Israel, 4,049,534, Cl. 204-299.00R.
E.G.O. Elektro-Geraete Blanc und Fischer: *See*—
Fischer, Karl; and Kicherer, Robert, 4,050,044, Cl. 337-137.000.
E. J. Brooks Company: *See*—
Lundberg, George A., 4,049,313, Cl. 292-307.00R.
E. R. Squibb & Sons, Inc.: *See*—
Breuer, Hermann; and Treuner, Uwe D., 4,049,651, Cl. 544-21.000.
Metzger, Julio, 4,049,898, Cl. 536-17.000.
Earley, James Valentine: *See*—
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,049,666, Cl. 260-294.80R.
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,049,667, Cl. 260-294.80R.
Eastman Kodak Company: *See*—
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Albers, Kenneth H., 4,049,752, Cl. 260-878.00R.
Gilkey, Russell; Hilbert, Samuel D.; and Wicker, Thomas H., Jr., 4,049,621, Cl. 260-40.000.
Hawkins, Gary Fred; and Gass, Robert Lee, 4,049,698, Cl. 560-127.000.
Weaver, Max A.; Straley, James M.; and Moore, William H., 4,049,643, Cl. 260-207.100.
Eberhardt, Timothy J. Oven rack. 4,048,984, Cl. 126-337.00R.
Ecolaire Incorporated: *See*—
Walters, Thomas, Jr., 4,049,240, Cl. 259-3.000.
Eddy, Robert A.; Gustafson, Norman F.; and Erwin, Stephen J., to Wyman-Gordon Company. Forming and heat treating process. 4,048,836, Cl. 72-364.000.
Edgar, Albert D. General purpose pole-zero single amplifier active filter. 4,050,023, Cl. 328-127.000.
Edgcombe, Christopher John, to English Electric Valve Co., Ltd. Resonant cavity tubes. 4,049,995, Cl. 315-5.390.
Edie, Dennis L., to Honny Chemicals Company, Ltd. Bonding rubber to ferrous metal through a deposit of copper and adhesive and laminate therefrom. 4,049,875, Cl. 428-462.000.
Edwards, Leroy H., to Chevron Research Company. Bactericidal, fungicidal and herbicidal 2-(N,N-dialkylamino)-3,5-dinitrothiophenes. 4,049,421, Cl. 71-90.000.
Edwards, Michael John, to RFD Systems Engineering Limited. Light beam deflection means particularly for range compensation in weapons training aids. 4,048,730, Cl. 35-25.000.
Ege, Sigmund, to Kloften & Kloften A/S. Buoyancy device and method. 4,048,686, Cl. 9-8.00R.
Eggers, Hugo: *See*—
Reuting, Hans-Werner; and Eggers, Hugo, 4,050,043, Cl. 335-237.000.
Ehlscheid, Gunter; Langenbeck, Peter; and Stemmler, Kurt, to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG. Method of and apparatus for cutting material to shape from a moving web by burning. 4,049,945, Cl. 219-121.0LM.
Eichinger, Frithjof: *See*—
Stamer, Walter; and Eichinger, Frithjof, 4,049,247, Cl. 266-182.000.
Eigenmann, Ludwig. Reflex reflecting system for road surface marking. 4,049,337, Cl. 350-105.000.
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Chasen, Lee Richard; and Einhorn, Ruediger, 4,049,225, Cl. 248-219.400.
Eisenhardt, Fred W.; and Tonsfeldt, Wayne S., to Alloway Manufacturing, Inc. Sugar beet harvester. 4,049,058, Cl. 171-58.000.
Eisentraeger, Klaus; Immel, Guenther; Marx, Matthias; Reinhard, Hans; Spoor, Herbert; and Storck, Gerhard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of self-adhesive coatings on flat substrates. 4,049,847, Cl. 427-207.00B.
Eklund, Erik Paul: *See*—
Udengaard, Poul Werner; Mosevang, Orla; Thomsen, Finn Erling; and Eklund, Erik Paul, 4,049,403, Cl. 55-378.000.
Elbert, Raymond John; and Farrier, Ernest Gilbert, to Union Carbide Corporation. Metal porous abradable seal. 4,049,428, Cl. 75-208.00R.
Eldred, Charles R.: *See*—
Reesman, Stanley H.; and Eldred, Charles R., 4,049,840, Cl. 426-634.000.
Electric Power Research Institute, Inc.: *See*—
Mitoff, Stephen Paul, 4,049,885, Cl. 429-104.000.
Elettrocarbonium S.p.A.: *See*—
Genevois, Jean Louis; and Bufarale, Rolando, 4,049,900, Cl. 13-7.000.
Eli Lilly and Company: *See*—
Molloy, Bryan Barnet, 4,049,827, Cl. 424-330.000.
Ellers, Fred S.; Hally, Hugh G.; McIlveen, Edward E.; and Doble, William A., to Bechtel International Corporation; and Okonite Company, The. Methods for emplacing and maintaining transmission lines. 4,048,807, Cl. 61-105.000.
Ellsworth, Orval T.: *See*—
Korner, Anneliese F.; Piziali, Robert L.; and Ellsworth, Orval T., 4,048,684, Cl. 5-370.000.
Elmeg Elektro-Mechanik GmbH: *See*—
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Elmer, Otto C., to General Tire & Rubber Company, The. Adhesion of glass fibers to rubber. 4,049,603, Cl. 260-28.50R.
Elmore, Ethelbert P., Jr. Airborne microwave path modeling system. 4,050,067, Cl. 343-5.00R.
Elsasser, Konrad. Sliding closure arrangement. 4,049,153, Cl. 220-345.000.
Elsener, Anton; Gehrt, Hans Harald; Medinger, Bernhard; and Wiese, Volkhard, to Ciba-Geigy Corporation. Process for the distortion-free coloration of polyolefins with organic pigments. 4,049,615, Cl. 260-39.00P.
Elsener, Fritz, to Chr. Hausler AG. Four-roller sheet bending machines. 4,048,830, Cl. 72-175.000.
Elsnau, Walter Hugh, to Procter & Gamble Company, The. Antiperspirant stick. 4,049,792, Cl. 424-66.000.
Elsner, Burckhardt; Plevak, Lubomir; Lagodka, Gunter; and Rosenberg, Harry, to Gewerkschaft Eisenhutte Westfalia. Support assemblies for use in mine workings. 4,048,804, Cl. 61-45.00D.
Emerson Electric Co.: *See*—
Lambert, Rudolph J., 4,049,973, Cl. 307-66.000.
Emerson, Robert T.: *See*—
Peterson, Glenn E.; Emerson, Robert T.; and Schoenlein, William J., 4,048,952, Cl. 118-6.000.
Emhart Industries, Inc.: *See*—
Raudat, John L.; and Johnson, Lloyd D., 4,048,783, Cl. 53-61.000.
Emmett, John Colin: *See*—
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,049,672, Cl. 548-342.000.
Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, to Sankyo Company Limited. Physiologically active substances and fermentative process for producing the same. 4,049,495, Cl. 195-36.00R.
Endo, Takaya: *See*—
Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Kato, Katsunori, 4,049,455, Cl. 96-76.00R.
Energy Development Associates: *See*—
Hart, Thomas G., 4,049,880, Cl. 429-49.000.
Engel, William K., to Caterpillar Tractor Co. Radial piston pump or motor with unrestricted inlet means. 4,048,907, Cl. 91-492.000.
Engler, Gunter: *See*—
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.
Englert, Robert Dixon; and Armstrong, Kenneth Ronald, to Dresser Industries, Inc. Fuel introduction device for internal combustion engine. 4,049,758, Cl. 261-62.000.
English Electric Valve Co., Ltd.: *See*—
Edgcombe, Christopher John, 4,049,995, Cl. 315-5.390.
English, Robert William, to Mastermix Engineering Company Limited, The. Horizontal, detachable, ball mill. 4,049,205, Cl. 241-67.000.
Enkner, Bernhard: *See*—
Moser, Peter; Eysn, Manfred; Enkner, Bernhard; Berger, Rupert; Wagner, Wolfgang; and Spannlang, Ronald, 4,049,249, Cl. 266-247.000.
Enomoto, Masahisa: *See*—
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Enomoto, Masahisa, 4,049,530, Cl. 204-273.000.
EPPCO: *See*—
Gerek, Gene; and Coucher, Robert G., 4,049,842, Cl. 427-34.000.
Erco Industries Limited: *See*—
Meyers, Norman W., 4,049,513, Cl. 204-290.00F.
Erdmann, Hans; and Miller, Franz-Friedrich, to BASF Aktiengesellschaft. Complex basic zirconium salts and aluminum salts. 4,049,379, Cl. 8-94.260.
Erickson, Henry; and Mooi, John, to Atlantic Richfield Company. Method for producing a supported catalyst. 4,049,582, Cl. 252-466.0PT.
Eriksson, Sven Vilhelm: *See*—
Andersson, Henry Veine; and Eriksson, Sven Vilhelm, 4,049,302, Cl. 292-201.000.
Erwin, Stephen J.: *See*—
Eddy, Robert A.; Gustafson, Norman F.; and Erwin, Stephen J., 4,048,836, Cl. 72-364.000.
Escher Wyss Limited: *See*—
Marchioro, Ignazio, 4,048,701, Cl. 29-116.0AD.
Eskridge, Brewster B.; Lyon, Boyce M.; and Boasson, Eduard H., to Akzona Incorporated. Process for improving crystallinity in nylon 6. 4,049,766, Cl. 264-210.00F.
Essilor International Cie Generale d'Optique: *See*—
Godot, Jean Marie, 4,049,254, Cl. 269-156.000.

Estebanez, Joseph; Harrison, David V.; Jones, Clifford P.; and Wilson, Henry G. E., to Shell Internationale Research Maatschappij B.V. Apparatus for treating a surface. 4,048,956, Cl. 118-306.000.
Eta A.G. Ebauches-Fabrik: *See*—
Giger, Urs, 4,048,835, Cl. 72-334.000.
Eue, Ludwig: *See*—
Metzger, Carl; Eue, Ludwig; and Hack, Helmuth, 4,049,670, Cl. 260-306.80D.
Eutectic Corporation: *See*—
Fluckiger, Jean-Louis; and Roulet, Pierre Alfred, 4,049,946, Cl. 219-131.00R.
Evans, Albert B., Jr., to United States of America, Navy. Complex pulse repetition frequency generator. 4,049,953, Cl. 235-150.300.
Evans, John James Alexander; and Holan, George, to Commonwealth Scientific and Industrial Research Organization. Triazoles. 4,049,815, Cl. 424-269.000.
Evans Products Company: *See*—
Wolak, Norbert S.; and Wolak, Thomas J., 4,048,755, Cl. 49-130.000.
Exxon Production Research Company: *See*—
Gerwick, Ben G., Jr., 4,048,943, Cl. 114-256.000.
Howell, James D., 4,049,239, Cl. 254-172.000.
Mifsud, Joseph F., 4,049,077, Cl. 181-114.000.
Exxon Research & Engineering Co.: *See*—
Boggs, Jesse K., 4,049,730, Cl. 260-663.000.
Dominey, Alan Michael, 4,049,560, Cl. 252-33.300.
Horowitz, Harold S.; and Longo, John M., 4,049,790, Cl. 423-599.000.
Plumlee, Karl W.; and Vernon, Lonnie W., 4,049,536, Cl. 208-10.000.
Plumlee, Karl W.; and Vernon, Lonnie W., 4,049,537, Cl. 208-10.000.
Rao, Bhaskara M. L.; and Silbernagel, Bernard G., 4,049,881, Cl. 429-50.000.
Ryer, Jack; Zielinski, James; Miller, Harold N.; and Brois, Stanley J., 4,049,564, Cl. 252-51.50A.
Thompson, Arthur H.; and Whittingham, M. Stanley, 4,049,879, Cl. 429-191.000.
Whittingham, M. Stanley, 4,049,887, Cl. 429-112.000.
Eysn, Manfred: *See*—
Moser, Peter; Eysn, Manfred; Enkner, Bernhard; Berger, Rupert; Wagner, Wolfgang; and Spannlang, Ronald, 4,049,249, Cl. 266-247.000.
F. B. J. Engineering Services Pty. Limited: *See*—
Urquhart, William James, 4,048,908, Cl. 92-159.000.
Urquhart, William James, 4,048,975, Cl. 123-193.00P.
F. W. Luling KG, Firma: *See*—
Luling, Adalbert, 4,048,822, Cl. 70-93.000.
Fabian, Wolfgang; Klein, Konrad; and Sevenich, Theodor, to Hoesch Werke Aktiengesellschaft. Two-roller driving device. 4,048,831, Cl. 72-251.000.
Faircraft Engineering, Inc.: *See*—
Chubb, Wayne L., 4,049,091, Cl. 190-18.00R.
Falcy, Bernard Charles Albert; and Vaudant, Adrien, to Societe Anonyme des Hauts Fourneaux de la Chiers. Sealed cables for attachment to submarine anchorages. 4,048,794, Cl. 57-149.000.
Falk, Henry Joseph; and Tocci, Gerald Charles, to Union Carbide Corporation. Detachable container refrigeration system. 4,048,813, Cl. 62-297.000.
Falkenstein, Georg; Stein, Dieter; Haaf, Franz; Heinz, Gerhard; and Schoen, Ernst, to BASF Aktiengesellschaft. Manufacture of polyurethane compositions. 4,049,590, Cl. 260-2.5BE.
Farahar, Robert M., to ARC Concrete Limited. Concrete pipes. 4,049,022, Cl. 138-176.000.
Farha, Floyd, Jr.: *See*—
Drehman, Lewis E.; and Farha, Floyd, Jr., 4,049,743, Cl. 260-681.50R.
Farmer, Robert F., III: *See*—
Steckler, Robert; Robinson, Fred; and Farmer, Robert F., III, 4,049,608, Cl. 260-29.6SQ.
Farr, Glyn Phillip Reginald, to Girling Limited. Vehicle braking systems. 4,049,322, Cl. 303-6.00C.
Farrier, Ernest Gilbert: *See*—
Elbert, Raymond John; and Farrier, Ernest Gilbert, 4,049,428, Cl. 75-208.00R.
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., to Delalande S.A. N'-substituted derivatives of 4'-(N-piperazinylmethyl) spiro dibenzocycloheptadi- (or tri-) ene-5, 2'-dioxolane (1',3') their method of preparation and their application in therapeutics. 4,049,658, Cl. 260-268.0PC.
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., to Delalande S.A. N-substituted derivatives of 4 (N-piperazinylmethyl) spiro dibenzocycloheptadi- (or tri-) ene-5, 2-dioxolane (1,3) their method of preparation and their application in therapeutics. 4,049,660, Cl. 260-268.0PC.
Fawcett, Howard N., to Cambridge Instrument Company, Inc. Feedback signal generator for a servo control circuit. 4,050,002, Cl. 318-661.000.
Faymonville, Ernst, to Malmedie & Co. Maschinenfabrik. Arrangement for controllably reciprocating a workpiece gripping assembly of a multi-stage press. 4,048,838, Cl. 72-405.000.
Federal Metal Hose Corporation, The: *See*—
Foti, Sam J., 4,049,298, Cl. 285-177.000.
Fedorov, Oleg Georgievich: *See*—
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.
Fegley, Charles R.; Winings, Richard H.; and Yeich, Clifford R., Jr., to Western Electric Company, Inc. Methods of and apparatus for sorting articles in accordance with their resistivity and thickness. 4,049,123, Cl. 209-74.00M.
Feiler, Robert J. Sport practice apparatus. 4,049,266, Cl. 273-29.00A.
Feinstein, Paul, Jr.: *See*—
Church, John Allen; Feinstein, Paul, Jr.; Hunt, Ronald Eugene; McDaniels, Louis Marion; and Munch, Paul Francis, 4,049,256, Cl. 271-9.000.
Feldman, Ilya Afanasievich: *See*—
Kasatkin, Alexei Fedoseevich; Smirnov, Jury Vasilievich; and Feldman, Ilya Afanasievich, 4,049,926, Cl. 179-115.00V.
Feller, Herman H.: *See*—
Shanahan, Francis V.; and Feller, Herman H., 4,048,747, Cl. 43-114.000.
Ferich, Joseph. Bathroom partitions. 4,048,767, Cl. 52-35.000.
Ferranti Limited: *See*—
Colaco, Stephen Francis, 4,049,975, Cl. 307-213.000.
Ferse, Armin: *See*—
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.
Fex, Hans: *See*—
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,799, Cl. 424-211.000.
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,800, Cl. 424-211.000.
Fidler, Fred: *See*—
Beveridge, John; Davies, Thomas Roderick Harries; Fidler, Fred; and Ring, Maurice Frank, 4,048,935, Cl. 113-120.00F.
Field, Denton: *See*—
Metcalfe, Kenneth A.; Wilson, Clive Westgarth; and Field, Denton, 4,049,446, Cl. 96-1.0LY.
Fikentscher, Rolf: *See*—
Greif, Norbert; Fikentscher, Rolf; and Sanner, Axel, 4,049,851, Cl. 427-386.000.
Fincke, George C.; and Taylor, George W., to United States of America, Army. Fast-tuned multiplexer-power combiner. 4,050,040, Cl. 333-73.00C.
Finegold, Hyman B.: *See*—
Bucholtz, Glen E.; and Finegold, Hyman B., 4,049,208, Cl. 242-7.05B.
Fink, Helmuth; and Wess, Guenter, to Siemens Aktiengesellschaft. Circuit arrangement for measuring the phase modulation disturbance of a test signal. 4,050,014, Cl. 324-57.00H.
Finley, George C. Elastomeric stripper having metal head and stripping plates. 4,048,889, Cl. 83-138.000.
Finn, Donald J. Currency bill billfold file. 4,049,035, Cl. 150-38.000.
Firth, Donald; and Cunningham, Sinclair Upton, to National Research Development Corporation. Low-stress cam-driven piston machines. 4,048,906, Cl. 91-491.000.
Fischer, Karl; and Kicherer, Robert, to E.G.O. Elektro-Geraete Blanc und Fischer. Electrical switch. 4,050,044, Cl. 337-137.000.
Fischer & Porter Co.: *See*—
Herzl, Peter J., 4,048,854, Cl. 73-194.0VS.
Fischer, Robert L.: *See*—
Oldenburg, Dorrance; and Fischer, Robert L., 4,049,032, Cl. 144-2.00Z.
Fisher, Charles B.: *See*—
Fisher, Sidney T.; and Fisher, Charles B., 4,049,053, Cl. 166-249.000.
Fisher, Sidney T.; and Fisher, Charles B. Recovery of hydrocarbons from partially exhausted oil wells by mechanical wave heating. 4,049,053, Cl. 166-249.000.
Fisons Limited: *See*—
Gates, Peter Stuart, 4,049,420, Cl. 71-88.000.
Harper, Douglas Charles; Robinson, Norman; and Janikowski, Stanislaw Maria, 4,049,774, Cl. 423-167.000.
Fitzgerald, William Maurice Bard. Fuel injector. 4,048,970, Cl. 123-139.0AJ.
Fitzsimons, Ron. Golf ball warmer. 4,049,949, Cl. 219-521.000.
Flach, Hans-Georg; and Stier, Bernhard, to VDO Adolf Schindling AG. Moving-coil measuring system with a large pointer deflection. 4,050,021, Cl. 324-150.000.
Fleenor, Warren O. Prime mover and box car combination for handling cargo. 4,049,136, Cl. 214-38.00R.
Fleetwood Furniture Company: *See*—
Derks, Harry G., 4,048,729, Cl. 35-8.00A.
Fleig, Helmut; Hagen, Helmut; Naarmann, Herbert; and Penzien, Klaus, to BASF Aktiengesellschaft. Self-extinguishing thermoplastic molding compositions. 4,049,622, Cl. 260-2.5HB.
Fleming, Thomas F.: *See*—
Byrne, John A.; Rhea, Charles K., Jr.; and Fleming, Thomas F., 4,049,950, Cl. 235-61.60R.
Flender, Jacques, to SAFT-Societe des Accumulateurs Fixes et de Traction. Centrally-activated deferred-action silver-zinc battery. 4,049,888, Cl. 429-115.000.
Fliege, Werner: *See*—
Nissen, Axel; Fliege, Werner; and Voges, Dieter, 4,049,571, Cl. 252-430.000.
Flora, James D. Dual biased static sensing magnetic transducer. 4,050,012, Cl. 324-43.00R.

Florian, John, to Mobil Oil Corporation. Thermoformed hot drink cup. 4,049,187, Cl. 229-1.50B.
Florian, Rudolf, to Dorentruper Sand- und Thonwerke GmbH. Method and arrangement for use in lining articles, particularly melting ovens. 4,049,759, Cl. 264-30.000.
Fluckiger, Jean-Louis; and Roulet, Pierre Alfred, to Eutectic Corporation. Power supply for electric arc welding. 4,049,946, Cl. 219-131.00R.
FMC Corporation: *See*—
Chiang, John S., 4,049,786, Cl. 423-513.000.
Follert, Hans Gunter, to Gewerkschaft Eisenhutte Westfalia. Tunnel driving apparatus. 4,049,317, Cl. 299-33.000.
Fonti, Richard A. Target board sail game. 4,049,271, Cl. 273-95.00R.
Ford, Michael Alan, to Perkin-Elmer Limited. Pulsed radiation detector system. 4,049,970, Cl. 250-461.00B.
Ford Motor Company: *See*—
Gale, Ronald J.; and Rowbotham, Edwin M., 4,049,037, Cl. 152-427.000.
Heintz, Walter K., 4,049,889, Cl. 429-174.000.
Saillant, Roger B.; and Weber, Neill, 4,049,877, Cl. 429-11.000.
Foreman, Joseph S., Jr : *See*—
Harris, Hal; and Foreman, Joseph S., Jr., 4,049,955, Cl. 235-152.000.
Forgeal, Societe pour le Forgeage et l'Estampage des Alliages Legers: *See*—
Lucas, Roger; and Auberger, Jacques, 4,048,828, Cl. 72-83.000.
Forrest, Charles Phelps. Football place-kicking device. 4,049,267, Cl. 273-55.00B.
Forslund, Erik Torsten, to Ostbergs Fabriks AB. Device for use in removal of stumps. 4,048,733, Cl. 37-2.00R.
Forsslund, Erik Ejnar. Intermittence-responsive working-time indicator. 4,049,952, Cl. 235-92.00T.
Fort, Pierre Henri Marie; and Pierrel, Michel, to Pont-A-Mousson S.A. Installation for extracting pipes from a centrifugal casting machine. 4,049,043, Cl. 164-295.000.
Fortson, Charles B., to United States of America, Navy. Gas mixing device. 4,049,402, Cl. 55-208.000.
Foti, Sam J., to Federal Metal Hose Corporation, The. Compression coupling. 4,049,298, Cl. 285-177.000.
Fountain, Claude Lloyd, to Lockheed Aircraft Corporation. Relief of inter-compartment differential pressure in aircraft. 4,049,221, Cl. 244-118.00R.
Fox, Charles L., Jr., to Research Corporation. Zinc sulfadiazine and its use in the treatment of burns. 4,049,802, Cl. 424-229.000.
Fox Grinders, Inc.: *See*—
Bair, James G., Jr., 4,048,762, Cl. 51-206.500.
France, Larry R.: *See*—
Pegnim, Timothy C.; France, Larry R.; Sherman, John G.; and MacQuignon, Claude, 4,050,079, Cl. 346-145.000.
Francis, Gaylord L.; and Morelli, Amedeo J., to North American Philips Corporation. Resistor end terminations. 4,050,053, Cl. 338-332.000.
Francis, George W., Jr., to Saginaw Products Corporation. Latch assembly for containerized baggage trailer. 4,049,286, Cl. 280-179.00R.
Franek, Jozef Tadeusz; and Porucznik, Paul, to Metal Box Limited. Feeder for feeding sheets having a recessed profile end edge. 4,049,261, Cl. 271-269.000.
Frangioni, Alessandro: *See*—
Bianchi, Sergio; Bornengo, Mario; and Frangioni, Alessandro, 4,049,755, Cl. 260-987.000.
Frazee, Lawrence E., to Plessey Incorporated. Humidity sensor, material therefor and method. 4,050,048, Cl. 338-35.000.
Frazier, Robert Doyal, to Champion International Corporation. Stop motion for narrow width needle looms. 4,049,023, Cl. 139-339.000.
Frechette, Kenneth R., to Xerox Corporation. Print wheel mounting assembly. 4,049,110, Cl. 197-53.000.
Fred M. Dollorfano, Jr. and Donald P. Amassa, Trustees of The Stoneleigh Trust: *See*—
Massa, Frank, 4,050,056, Cl. 340-1.00R.
Frederiksen, Ronald A.: *See*—
Muzyczko, Thaddeus M.; Frederiksen, Ronald A.; and York, David L., 4,049,746, Cl. 260-851.000.
Fredholm, Bo: *See*—
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,799, Cl. 424-211.000.
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,800, Cl. 424-211.000.
Freebairn, Hugh T., to Catalytic Generators, Inc. Chill prevention for banana underpeel. 4,049,837, Cl. 426-308.000.
Freed, Meier E.; and Potoski, John R., to American Home Products Corporation. Benzobicycloalkane amines. 4,049,701, Cl. 560-130.000.
Freeman, George M.; Dulson, John E.; and Morris, Monica F., to Texasgulf Canada Ltd. Zinc hydrometallurgical process. 4,049,514, Cl. 204-119.000.
Freissmuth, Alfred; Heinl, Walter; Knahl, Herbert; and Pfluger, Erich, to Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft. Composition for desulfurizing iron melts. 4,049,442, Cl. 75-55.000.
French, William George, to Bell Telephone Laboratories, Incorporated. Method for making optical fibers with variations in core diameter. 4,049,413, Cl. 65-3.00A.
Frink, Russell E.; and Milianowicz, Stanislaw A., to Westinghouse Electric Corporation. Quick-acting movable operating-column tripping device. 4,049,936, Cl. 200-146.00R.
Fritz, Edward A.: *See*—
Storm, Donald P.; Sammarco, Peter; Fritz, Edward A.; and Mackert, Robert J., 4,049,207, Cl. 241-101.700.
Froberg, Robert W., to Pfizer Inc. Apparatus for vapor depositing pyrolytic carbon on porous sheets of carbon material. 4,048,953, Cl. 118-49.000.
Fromm, Ellsworth H.; and Murray, Norman R., to Phillips Petroleum Company. Variable dome valves and combustors provided with said valves. 4,049,021, Cl. 137-625.310.
Fruehauf Corporation: *See*—
Chieger, George, 4,049,285, Cl. 280-106.00T.
Fruin, Harry James, to Dresser Europe S.A. Mining machine with cam-operated water jet pump. 4,049,318, Cl. 299-81.000.
Fryer, Rodney Ian: *See*—
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,049,666, Cl. 260-294.80R.
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,049,667, Cl. 260-294.80R.
Frystak, Richard, to Bell & Howell Company. Document feeder apparatus. 4,049,257, Cl. 271-114.000.
Fuchs, Ernest F.: *See*—
Ross, Joseph; and Fuchs, Ernest F., 4,049,364, Cl. 417-360.000.
Fuel Computer Corporation: *See*—
Haviland, Herbert, deceased; Haviland, Diane, administratrix; Smith, Arthur; and Boyer, Charles, 4,049,193, Cl. 236-46.00R.
Fuji Photo Film Co., Ltd.: *See*—
Honjo, Satoru; and Takimoto, Masaaki, 4,049,448, Cl. 96-1.50R.
Ogawa, Hiroshi; Tamai, Yasuo; and Nishina, Tutomu, 4,049,871, Cl. 428-425.000.
Fuji Xerox Co., Ltd.: *See*—
Nakaguchi, Michiharu; and Nagashima, Toshio, 4,048,958, Cl. 118-658.000.
Fujii, Shouji: *See*—
Sato, Hiroshi; Okumura, Munehiro; Itani, Fujio; Fujii, Shouji; Kakuda, Tsutomu; and Nakatui, Hiroshi, 4,049,593, Cl. 260-2.50E.
Fujikura Kasei Co., Ltd.: *See*—
Aoyama, Tsuyoshi; Hayashi, Yoshimasa; Nagano, Michio; and Nagase, Hiroshi, 4,049,874, Cl. 428-451.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,049,664, Cl. 260-294.80C.
Fujita, Nobuo: *See*—
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.
Fujita, Rokuro: *See*—
Ko, Keiun; Takashina, Naomitsu; Shiokawa, Shigeru; and Fujita, Rokuro, 4,049,634, Cl. 260-75.0UA.
Fujita, Tadao: *See*—
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Fujita, Tadao, 4,049,507, Cl. 204-39.000.
Fujitsu Ten Limited: *See*—
Okamoto, Kenzi, 4,050,089, Cl. 360-106.000.
Fukushima, Yoshikiyo; and Watanabe, Shigeru, to Nippon Concrete Industries Co. Ltd.; and Nikkai Giken Co., Ltd. Concrete pile. 4,048,805, Cl. 61-56.000.
Fullenkamp, Anthony L.; and Russell, Herman F., to Hobart Corporation. Meat cleaning machine. 4,048,689, Cl. 15-3.170.
Fuller, Willard A., to Hooker Chemicals & Plastics Corporation. Production of chlorine dioxide with product slurry metathesis. 4,049,784, Cl. 423-478.000.
Fuller, Willard A., to Hooker Chemicals & Plastics Corporation. Production of chlorine dioxide with product slurry metathesis. 4,049,785, Cl. 423-478.000.
Funderburk, William Henry, Jr., to A. H. Robins Company, Inc. Method of treating allergy. 4,049,821, Cl. 424-274.000.
Furber, Robert Arthur: *See*—
Swinkels, Godefridus Maria; Furber, Robert Arthur; Milner, Edward Francis Godfrey; Genik-Sas-Berezowsky, Roman Michael; and Kirby, Charles Ray, 4,049,770, Cl. 423-37.000.
Furkert, Herbert, to Davy Powergas GmbH. Process for the manufacture of lactams. 4,049,646, Cl. 260-239.30A.
Furman, Anthony H., to General Electric Company. Method for extrusion of coal containing body. 4,049,390, Cl. 44-10.00R.
Furman, Anthony H., to General Electric Company. Method for extrusion of coal containing body. 4,049,392, Cl. 44-10.00R.
Futaba Denshi Kogyo K. K.: *See*—
Kishino, Takao; and Utamura, Yukihiko, 4,049,993, Cl. 313-497.000.
Futamura, Kazumasa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purifier. 4,049,387, Cl. 23-277.00C.
Futatsuki, Sachio: *See*—
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.
Fyock, Norman G. Variable speed power transmission for small vehicles and the like. 4,048,871, Cl. 74-687.000.
Gail, William A. Trailable houseboat. 4,048,685, Cl. 9-1.200.
Gaines, George L., Jr.: *See*—
Lavallee, Francois A.; Le Grand, Donald G.; and Gaines, George L., Jr., 4,049,649, Cl. 542-400.000.
Galambos, Gyula: *See*—
Kadar, Ferenc; and Galambos, Gyula, 4,050,051, Cl. 338-202.000.
Galbreath, Gerald W.: *See*—
Dietrich, Alfred T.; and Galbreath, Gerald W., 4,049,311, Cl. 296-24.00R.
Gale, Ronald J.; and Rowbotham, Edwin M., to Ford Motor Company. Inflation valve for tubeless tire. 4,049,037, Cl. 152-427.000.

Galov, Lev Ivanovich: *See*—
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Gangelhoff, Fred R. Scissors sharpener. 4,048,760, Cl. 51-116.000.
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Garlic, Richard A., to Xerox Corporation. Microprocessor with parallel operation. 4,050,058, Cl. 364-200.000.
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Bainard, Dean R., 4,049,281, Cl. 277-1.000.
Garnett, David Morris. Ball bearings. 4,048,702, Cl. 29-148.40A.
Garnett, Wayne A. Toilet seat. 4,048,679, Cl. 4-237.000.
Garrett Corporation, The: *See*—
Parker, Kenneth O., 4,049,051, Cl. 165-166.000.
Garvey, Eugene N., to Woodward Mfg. & Sales Co., Inc. Electrically powered hand truck with stacker attachment. 4,049,083, Cl. 187-9.00R.
Garvin, Hugh L.; Yariv, Amnon; and Somekh, Sasson, to Hughes Aircraft Company. Process for fabricating small geometry semiconductive devices including integrated components. 4,049,944, Cl. 219-121.0EM.
Garwood, William E.; Jacob, Solomon M.; Kuo, James C.; and Wise, John J., to Mobil Oil Corporation. Conversion of coal to high octane gasoline. 4,049,734, Cl. 260-668.00R.
Gass, Robert Lee: *See*—
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Gates, Peter Stuart, to Fisons Limited. Certain sulfonic acid esters of certain 2,3-dihydro-2-hydrocarbonoxy-benzofuran-5-ols and their use as herbicides and plant growth controllers. 4,049,420, Cl. 71-88.000.
Gaul, Michael F. Modular crypt system. 4,048,772, Cl. 52-136.000.
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Gaynor, Joseph, to Bell & Howell Company. Image transfer layers for infrared transfer processes. 4,049,843, Cl. 427-43.000.
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Baumann, Jan; and Petter, Franz, 4,049,363, Cl. 416-157.00B.
Gebert, Meril D. Circuit breaker. 4,049,073, Cl. 180-103.00A.
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Gebhardt, Paul A. Windshield covers. 4,049,036, Cl. 150-52.00K.
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Gelfand, Samuel, to Hooker Chemicals & Plastics Corporation. Polyhaloindene compounds. 4,049,727, Cl. 260-650.00R.
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Gellato, Michel; Seris, Jean-Louis; and Suberloco, Jeannine, to Societe Nationale Elf Aquitaine. Photochemical process for the production of halogeno-alkanes. 4,049,516, Cl. 204-158.0HA.
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Ventz, George A., 4,049,259, Cl. 271-151.000.
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Durbin, Charles R.; and Schoenbachler, Bernard W., 4,048,834, Cl. 72-294.000.
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Henley, Virgil E., 4,049,486, Cl. 156-405.00R.
Genevois, Jean Louis; and Bufarale, Rolando, to Elettrocarbonium S.p.A. Continuous graphitizing furnace with a vertical displacement of the charge. 4,049,900, Cl. 13-7.000.
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George, Henry Howard; and Billings, Ronald Joseph, to Chemetron Corporation. Double-sigmoid connector. 4,049,356, Cl. 403-173.000.
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Kleis, Gustav, 4,049,279, Cl. 274-15.00R.
Gerber, Bernhard, to Greiner Electronic AG. Apparatus for obtaining a mean voltage value. 4,050,025, Cl. 328-143.000.
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Pearl, David R., 4,048,891, Cl. 83-528.000.
Gerek, Gene; and Coucher, Robert G., to EPPCO. Process for interior coating small mouth container open at one end. 4,049,842, Cl. 427-34.000.
Germer, Warren R.; and Palmer, Ansell W., to General Electric Company. Multiple rate electrical energy metering system and method. 4,050,020, Cl. 324-116.000.
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, to Dr. C. Otto & Comp. G.m.b.H. Control system for a coal gasification plant. 4,049,394, Cl. 48-62.00R.
Gernhardt, Paul; Grams, Wolfgang; Pohl, Siegfried; and Danguillier, Wilhelm, to Dr. C. Otto & Comp. G.m.b.H. Method and apparatus for removing vapors and aerosols from gases produced in a gasification plant. 4,049,570, Cl. 252-373.000.
Gerritsen, Dirk J.; and Kuipers, Marcus, to N. V. Tramposafe. Diving board. 4,049,263, Cl. 272-66.000.
Gerwick, Ben G., Jr., to Exxon Production Research Company. Arctic caisson. 4,048,943, Cl. 114-256.000.
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Follert, Hans Gunter, 4,049,317, Cl. 299-33.000.
Golla, Franz, 4,049,529, Cl. 204-246.000.
Stuckmann, Dieter; Babendererde, Siegmund; Jutte, Hans; and Bokemeyer, Reinhard, 4,048,806, Cl. 61-85.000.
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Weirich, Walter; and Kussel, Willy, 4,048,866, Cl. 74-242.1FP.
Ghiselin, Robert Earlc: *See*—
Louw, Johan August; and Ghiselin, Robert Earle, 4,049,182, Cl. 228-2.000.
Ghisoni, Emilio. Recoil-operated automatic pistol. 4,048,901, Cl. 89-132.000.
Ghosh, Hitendra N.; Joshi, Madhukar L.; and Yeh, Tsu-Hsing, to International Business Machines Corporation. Utilization of an arsenic diffused emitter in the fabrication of a high performance semiconductor device. 4,049,478, Cl. 148-187.000.
Gibson, Kirk R.; Hughes, Thomas R.; and Jacobson, Robert L., to Chevron Research Company. Reduction of sulfur from hydrocarbon feed stock containing olefinic component. 4,049,542, Cl. 208-213.000.

Gibu, Yoshitaka: *See*—
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Giessner, Frank, to NCR Corporation. Actuator for a matrix print head. 4,049,108, Cl. 197-1.00R.
Giger, Urs, to Eta A.G. Ebauches-Fabrik. Method of punching a small hole in a precision mechanics workpiece. 4,048,835, Cl. 72-334.000.
Giglberger, Dieter: *See*—
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Gilbert, Ray, to Glass Containers Corporation. Canning jar lid test device and method. 4,048,845, Cl. 73-45.500.
Gilding, Denis K., to Tribotech. Method for coating bonding tools and product. 4,049,506, Cl. 204-38.00R.
Gilkey, Russell; Hilbert, Samuel D.; and Wicker, Thomas H., Jr., to Eastman Kodak Company. Textile fiber. 4,049,621, Cl. 260-40.000.
Gillain, Arthur Jules, to Ateliers Belges Reunis. Apparatus for extracting components of solids by means of a liquid. 4,049,386, Cl. 23-269.000.
Gillette Company, The: *See*—
Nigro, Louis V., 4,048,998, Cl. 128-263.000.
Gillingwater, Abel R. Wire bending fixture. 4,049,025, Cl. 140-102.500.
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Gilreath, Robert V., to Still-Man Mfg. Company. Oven having an electric heating element with a hinged support. 4,049,948, Cl. 219-404.000.
Giraud, Francois Louis, to Savec. Return loop for transport vehicles. 4,048,923, Cl. 104-21.000.
Girling Limited: *See*—
Farr, Glyn Phillip Reginald, 4,049,322, Cl. 303-6.00C.
Heinz, Kurt Erich; and Klassen, Horst Willi, 4,049,087, Cl. 188-73.500.
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Rath, Heinrich Bernhard, 4,049,086, Cl. 188-73.300.
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Gjosteen, Ole Georg; Terum, Trygve Olavson; and Aarflot, Aksel Ola, to A/S Ardal og Sunndal Verk. Dynamic vacuum treatment. 4,049,248, Cl. 266-202.000.
GKN Transmissions Limited: *See*—
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Glaser, Helmut; and Schick, Ludwig, to Siemens Aktiengesellschaft. Control unit for an a-c control element with full-wave control. 4,050,008, Cl. 323-19.000.
Glass Containers Corporation: *See*—
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Glassmeyer, John J., to Pullman Incorporated. Container handling arrangement with chassis adapter frame. 4,049,135, Cl. 214-38.0CC.
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Glazer, Patti. Collapsible doll house. 4,048,748, Cl. 46-12.000.
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Tice, Vernon Lawton; and Glover, Donald Francis, 4,049,194, Cl. 237-1.00A.
Glyco-Metall-Werke Daelen & Loos GmbH: *See*—
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Go, Santos W., to Owens-Illinois, Inc. Isophthalic acid/p,p-sulfonyldibenzoic acid/ethylene glycol/neopentyl glycol polyester compositions and containers made therefrom. 4,049,631, Cl. 260-75.00S.
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Gocho, Makio; Ota, Masanori; and Kuraishi, Tatsuo, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for measuring surface flatness of material. 4,048,849, Cl. 73-105.000.
Godfrey, Charles S., to Physics International Company. Oil and gas well stimulation. 4,049,056, Cl. 166-299.000.
Godot, Jean Marie, to Essilor International Cie Generale d'Optique. Supporting and positioning plate assembly for spectacle frames. 4,049,254, Cl. 269-156.000.
Goettel, John H. Manually-controlled pneumatically-actuated electric motor starter system. 4,050,091, Cl. 361-31.000.
Goettl, Adam D. Pan structure. 4,049,150, Cl. 220-62.000.
Goetz, Robert H. Heart massage apparatus. 4,048,990, Cl. 128-64.000.
Golan, Kenneth F.; and Winzeler, James E., to Caterpillar Tractor Co. Winch control. 4,048,799, Cl. 60-413.000.
Golda, Eugene: *See*—
Chu, Simon L.; and Golda, Eugene, 4,049,504, Cl. 204-38.00A.
Goldhaft, Morris. Case and closure cap for instant miniature fishing rod and reel. 4,049,165, Cl. 224-5.00E.
Goldsmith, Jesse M.; and O'Nan, Alex, Jr., to American Air Filter Company, Inc. Filter material charging apparatus for filter assembly for radioactive contaminants. 4,049,405, Cl. 55-479.000.
Golla, Franz, to Gewerkschaft Eisenhutte Westfalia. Apparatus with crust piercing and gas feeding means for use with electrolytic furnaces. 4,049,529, Cl. 204-246.000.
Goloff, Alexander; and Keske, Frank E., to Caterpillar Tractor Co. Thrust bearing. 4,049,327, Cl. 308-161.000.
Golyanov, Vyacheslav Mikhailovich; and Demidov, Alek Platonovich. Device for producing coatings by means of ion sputtering. 4,049,533, Cl. 204-298.000.
Gomez-Alecha, Laurentino, to Alacoop S. Coop. Bar stock feeding device. 4,049,173, Cl. 226-196.000.
Good, Wayne W., to Harter Corporation. Device for lockably securing appurtenances to a decorative wall. 4,048,768, Cl. 52-36.000.
Goodale, Clark W.; Morgan, Charles W.; and Rhoton, Albert L., to United Foam Corporation. Textured-foam coated urethane wall and ceiling covering and method of making the same. 4,049,848, Cl. 427-244.000.
Goodenough, John B.: *See*—
Hong, Henry Y-P; and Goodenough, John B., 4,049,891, Cl. 429-193.000.
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Scott, Kenneth W.; and Calderon, Nissim, 4,049,616, Cl. 260-42.320.
Googin, John M.; Schmitt, Charles R.; Schreyer, James M.; and Whitehead, Harlan D., to United States of America, Energy Research and Development Administration. Solar radiation absorbing material. 4,048,980, Cl. 126-270.000.
Gootjes, Johan, to Gist-Brocades N.V. Aminoalkylethers; composition and method of use. 4,049,825, Cl. 424-316.000.
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Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., 4,049,693, Cl. 260-465.00F.
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Lee, Timothy Charles Philip; and Millns, William, 4,049,588, Cl. 260-2.300.
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Gracheva, Zinaida Ivanovna: *See*—
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Majewska, Janina; Grams, Wiktor; Rybicki, Zbigniew; and Banasiak, Jozef, 4,049,775, Cl. 423-224.000.
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Gray, Paul R.; and Stephens, Mark L., to Signetics Corporation. Circuit and structure having high input impedance and DC return. 4,050,031, Cl. 330-24.000.
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Greif, Norbert; Fikentscher, Rolf; and Sanner, Axel, to BASF Aktiengesellschaft. Manufacture of bonded textile sheet materials. 4,049,851, Cl. 427-386.000.
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Grier, Nathaniel: *See*—
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Grill, Carl E.; and Levi, Phillip M., Jr. Tool for removing staples. 4,049,236, Cl. 254-28.000.

Grimm, Harald: *See*—
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.

Grimm, Wolfgang H., to Brown & Williamson Tobacco Corporation. Package having a slide actuated closure member. 4,049,117, Cl. 206-270.000.

Grinberg, Ijun Iosifovich; Zhukov, Evgeny Kuzmich; and Koshkin, Lev Nikolaevich. Method and apparatus for assembling aerosol valve. 4,049,389, Cl. 29-157.10R.

Groebke, Wolfgang; and Korte, Klaus, to Sandoz Ltd. Phenyl-azo-naphthyl dyes having a 2-acyloxy, alkoxy or hydroxy-1-arylethyl-amino group in the 4-position of the naphthalene ring. 4,049,642, Cl. 260-196.000.

Grof, Helmut Theodor; Schumann, Jochen; Wamser, Anton; Schumann, Rainer; and Thomas, Werner Friedrich, to Leybold-Heraeus GmbH & Co. Kg. Method and apparatus for the production of solid forging blocks with manipulator pins. 4,049,039, Cl. 164-52.000.

Gross, Hans; and Berti, Eugenio, to Siemens Aktiengesellschaft. Control unit for thyristors of a cycloconverter. 4,050,007, Cl. 363-87.000.

Gross, Udo: *See*—
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.

Grow Chemical Corporation: *See*—
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Grozdanov, Petko Kostadinov: *See*—
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Petrov, Peter Dimitrov; and Punchev, Simeon Georgiev, 4,049,172, Cl. 226-90.000.

Gruber, William Paul, to Allied Chemical Corporation. Pressure switch with diaphragm. 4,049,935, Cl. 200-83.00P.

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GTE Automatic Electric Laboratories Incorporated: *See*—
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Danner, Dean Wilson, 4,049,916, Cl. 179-6.00C.
Georgopulos, Thomas, 4,049,227, Cl. 248-309.00R.
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GTE Laboratories Incorporated: *See*—
Auborn, James J.; and Trickett, Elizabeth Ann, 4,049,024, Cl. 140-71.500.
Maringer, Robert E., 4,049,042, Cl. 164-278.000.

GTE Lenkurt Electric (Canada) Ltd.: *See*—
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GTE Sylvania Incorporated: *See*—
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Collins, Floyd K., 4,049,991, Cl. 313-417.000.
Keenan, James P., 4,049,988, Cl. 313-222.000.
Pawlikowski, Stanley Leonard; and Penird, Carl William, 4,050,080, Cl. 354-1.000.
Quatrini, L. Rita; and MacInnis, Martin B., 4,049,771, Cl. 423-49.000.
Schultz, Thomas W., 4,050,081, Cl. 354-1.000.
Shaffer, John W., 4,049,369, Cl. 431-95.00R.

Gueant, Auguste; and Mercier, Serge, to Produits Chimiques Ugine Kuhlmann. Method for preparing primary alcohols having alkyls branched at the second carbon. 4,049,725, Cl. 260-638.00B.

Guerra, Ricardo. Non-precious dental alloy. 4,049,427, Cl. 75-171.000.

Guildford, Allen John: *See*—
McLoughlin, Bernard Joseph; and Guildford, Allen John, 4,049,808, Cl. 424-248.400.

Guissard, Jean, to Saint-Gobain Industries. Cutting of glass. 4,049,167, Cl. 225-2.000.

Gulf & Western Industries, Inc.: *See*—
Seipp, William H., 4,050,098, Cl. 364-900.000.

Gundlach, Robert W.: *See*—
Simpson, George R.; Gundlach, Robert W.; and Butler, Gordon C., 4,049,344, Cl. 355-10.000.

Gunson, Brennand, to Russell (Shears) Limited. Scissors. 4,048,721, Cl. 30-254.000.

Gustafson, Norman F.: *See*—
Eddy, Robert A.; Gustafson, Norman F.; and Erwin, Stephen J., 4,048,836, Cl. 72-364.000.

Gutmann, Karl, Jr., to Karl Gutmann KG. Work desk construction. 4,049,331, Cl. 312-203.000.

H. K. Porter Company, Inc.: *See*—
Lillard, Richard E.; and Cope, William M., 4,049,092, Cl. 191-40.000.

H. L. Blachford Limited: *See*—
Blachford, John, 4,049,680, Cl. 260-404.500.

H. Moldow A/S: *See*—
Udengaard, Poul Werner; Mosevang, Orla; Thomsen, Finn Erling; and Eklund, Erik Paul, 4,049,403, Cl. 55-378.000.

H. Sasa-E International Inc.: *See*—
Sasse, Howard A., 4,048,985, Cl. 128-2.00S.

Haaf, Franz: *See*—
Falkenstein, Georg; Stein, Dieter; Haaf, Franz; Heinz, Gerhard; and Schoen, Ernst, 4,049,590, Cl. 260-2.5BE.

Haag, Werner O.: *See*—
Yan, Tsoung Y.; Huang, Tracy J.; and Haag, Werner O., 4,049,539, Cl. 208-65.000.

Haake, Heinz: *See*—
Schenk, Gerd; and Haake, Heinz, 4,049,883, Cl. 429-94.000.

Haas, Gerhard Julius; and Herman, Edwin Bernard, to General Foods Corporation. Pet food preservation. 4,049,835, Cl. 426-106.000.

Hack, Helmuth: *See*—
Metzger, Carl; Eue, Ludwig; and Hack, Helmuth, 4,049,670, Cl. 260-306.80D.

Haeger, Bruce Edwin; Krueger, James Elwood; Lowery, James Alfred; and Ritter, Lawrence, to American Cyanamid Company. Solution of a oxazepine for oral or parenteral administration. 4,049,809, Cl. 424-250.000.

Hafner, E.; and Mey, H., to Hasler AG. Message network for the transmission of digital telegrams with an address consisting of routing words. 4,049,906, Cl. 178-2.00C.

Hafner, Leo, to Treibacher Chemische Werke Aktiengesellschaft. Method for producing a pure cerium oxide. 4,049,463, Cl. 106-288.00B.

HAG Aktiengesellschaft: *See*—
Rothe, Rudolf; and Kohler, Johann, 4,049,409, Cl. 62-9.000.

Hagel, William C.; Smidt, Frederick A.; and Korenko, Michael K., to United States of America, Energy Research and Development Administration. High strength ferritic alloy. 4,049,431, Cl. 75-126.00C.

Hagel, William C.; Smidt, Frederick A.; and Korenko, Michael K., to United States of America, Energy Research and Development Administration. High strength ferritic alloy-D53. 4,049,432, Cl. 75-128.00F.

Hagen, Helmut: *See*—
Fleig, Helmut; Hagen, Helmut; Naarmann, Herbert; and Penzien, Klaus, 4,049,622, Cl. 260-2.5HB.

Haid, Erich: *See*—
Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 4,049,702, Cl. 260-501.120.

Hajos, Zoltan George, to Hoffman-La Roche Inc. Stereospecific total steroidal synthesis via substituted C/D-trans indanones. 4,049,677, Cl. 260-340.9AS.

Hakluyt, John Philip Dabbs; and Tilston, John Ronald, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Combustion apparatus. 4,048,797, Cl. 60-39.72R.

Hall, John C.: *See*—
DeRegnaucourt, Robert A.; Hall, John C.; and Caudill, Freddie R., 4,049,320, Cl. 301-13.0SM.

Hall, Richard H.: *See*—
Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., 4,049,736, Cl. 260-669.0QZ.

Haller, Freidrich A., to TRW Inc. Wire insertion apparatus. 4,048,711, Cl. 29-566.300.

Hally, Hugh G.: *See*—
Ellers, Fred S.; Hally, Hugh G.; McIlveen, Edward E.; and Doble, William A., 4,048,807, Cl. 61-105.000.

Halverson, Lance K., to Rolf Sporting Goods, Inc. Weight equalized foldable bat rack. 4,049,126, Cl. 211-104.000.

Hamada, Masa: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,049,497, Cl. 195-80.00R.

Hamer, Martin; and Batzer, Othmer F., to International Minerals & Chemical Corporation. Use of chelating agents for enhancing the settling of slimes. 4,049,547, Cl. 210-54.000.

Hamilton, Joel A. Controlled film advance apparatus. 4,048,782, Cl. 53-51.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Sliding coupling device for a lanyard or the like. 4,049,357, Cl. 403-209.000.

Hamisch, Paul H., Sr., to Monarch Marking Systems, Inc. Tag attaching apparatus. 4,049,174, Cl. 227-67.000.

Hamisch, Paul H., Sr., to Monarch Marking Systems, Inc. Tag attaching apparatus. 4,049,175, Cl. 227-67.000.

Hamlin, Thomas J.: *See*—
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,049,255, Cl. 271-3.000.

Hammer, Robert, to International Business Machines Corporation. Deposition mask and methods of making same. 4,049,857, Cl. 428-136.000.

Hamprecht, Gerhard; and Kersten, Siegfried, to BASF Aktiengesellschaft. Vinyl-substituted sulfamic acid halides. 4,049,709, Cl. 260-543.00R.

Hampson, James W.: *See*—
Luddy, Francis E.; Hampson, James W.; and Herb, Samuel F., 4,049,839, Cl. 426-607.000.

Hang, Kenneth Warren, to RCA Corporation. Glass frit composition for sealing window glass. 4,049,872, Cl. 428-427.000.

Hank, Dietrich; Lipfert, Gerhard; and Niesgoda, Tassilo, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Automatic regulation of the position of the lateral edge of a travelling web. 4,049,213, Cl. 242-57.100.

Hanneman, Rodney E.; Chrenko, Richard M.; and Kittle, Donald B., to General Electric Company. Process for reducing stress corrosion in a weld by applying an overlay weld. 4,049,186, Cl. 228-225.000.

Hansel, William B., to Suntech, Inc. Valve system for a vapor receiving system on a dispensing nozzle. 4,049,029, Cl. 141-206.000.

Hansen, Jay M.: *See*—
Prince, Paul R.; Skehan, Bernard J.; and Hansen, Jay M., 4,050,085, Cl. 358-219.000.
Hara, Akio: *See*—
Yamamoto, Takaharu; Nomura, Toshio; Asai, Tsuyoshi; and Hara, Akio, 4,049,876, Cl. 428-932.000.
Harada, Masanori; Katou, Shinzo; and Hayashi, Nobuyuki, to Nissan Motor Company. Vacuum advance control system. 4,048,966, Cl. 123-117.00A.
Harimoto, Takeshi; and Nishiyama, Keisuke, to Mitsui Mining & Smelting Co., Ltd. Electrodeposited metal plate peeling-off machine. 4,049,527, Cl. 204-198.000.
Harker, Alan B.: *See*—
Burton, C. Shepherd; Harker, Alan B.; and Ho, William W., 4,049,383, Cl. 23-232.00E.
Harkness, Joseph R.; and Braun, Daniel E., to Briggs & Stratton Corporation. Combination clutch and brake for rotary power mower. 4,048,787, Cl. 56-11.300.
Harkness, Joseph R.: *See*—
Kamlukin, Igor; and Harkness, Joseph R., 4,048,788, Cl. 56-11.300.
Harnden, Michael Raymond; and Wright, Nicholas David, to Beecham Group Limited. Antiviral 2-amino-5-[1-(indol-3-yl)alkyl]-2-thiazolin-4-ones. 4,049,816, Cl. 424-270.000.
Harper, Douglas Charles; Robinson, Norman; and Janikowski, Stanislaw Maria, to Fisons Limited. Process for reducing formation of gypsum scale durng the washing of calcium sulphate hemihydrate crystals. 4,049,774, Cl. 423-167.000.
Harper, Norman James; and Veitch, George Bryan Austin, to Allen & Hanburys Limited. Ethylene diamine derivatives. 4,049,663, Cl. 260-293.860.
Harr, Jerome Danforth, to International Business Machines Corporation. Dynamic transducer biasing signal amplifying circuitry. 4,050,086, Cl. 360-66.000.
Harris, Hal; and Foreman, Joseph S., Jr., to Campbell Taggart, Inc. Temporary memory for calculator-recorder system. 4,049,955, Cl. 235-152.000.
Harris, Thomas C.; and DeCrane, Charles E., to Olinkraft, Inc. Transition section for a bag filling device and method. 4,049,028, Cl. 141-10.000.
Harrison, Brian: *See*—
Rakowicz, Jan Antoni; and Harrison, Brian, 4,048,950, Cl. 118-6.000.
Harrison, David V.: *See*—
Estebanez, Joseph; Harrison, David V.; Jones, Clifford P.; and Wilson, Henry G. E., 4,048,956, Cl. 118-306.000.
Harrison, George W., to Team, Inc. Leak repair clamp. 4,049,296, Cl. 285-15.000.
Harsco Corporation: *See*—
Martino, Paul D.; and Barbre, Norris H., 4,049,762, Cl. 264-94.000.
Hart, Thomas G., to Energy Development Associates. Self-generating halogen liquification in a secondary battery. 4,049,880, Cl. 429-49.000.
Harter Corporation: *See*—
Good, Wayne W., 4,048,768, Cl. 52-36.000.
Harter, Joseph William; and Beitzel, Stuart Wallace, to O-3 Company. Apparatus for fluid treatment by corona discharge. 4,049,707, Cl. 250-531.000.
Hartmann & Braun Aktiengesellschaft: *See*—
Zollner, Wolf-Dieter, 4,050,015, Cl. 324-58.50C.
Hartmann, Clinton S., to Texas Instruments Incorporated. Programable filter using chirp-Z transform. 4,049,958, Cl. 235-193.000.
Hartung, Richard S., to Hedstrom Co. Wheel construction. 4,049,319, Cl. 301-1.000.
Harvey, Louis A. Horizontal shelf and vertical panel bracket. 4,049,226, Cl. 248-248.000.
Hase, Yoshihiko: *See*—
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,049,538, Cl. 208-50.000.
Hashimoto, Shitaro; and Sato, Yuuichi, to Sharp Kabushiki Kaisha. Four-level voltage supply for liquid crystal display. 4,050,064, Cl. 340-324.00M.
Hasler AG: *See*—
Hafner, E.; and Mey, H., 4,049,906, Cl. 178-2.00C.
Hasty, Russell D.: *See*—
Barnidge, Thomas O.; and Hasty, Russell D., 4,048,960, Cl. 119-28.000.
Hata, Kazuo: *See*—
Tanabe, Osamu; Nishizawa, Hisao; and Hata, Kazuo, 4,049,345, Cl. 355-41.000.
Hatakka, Vesa; and Sarvela, Jussi, to Oy Innovation Services Co. Trailer-type vehicle for lifting, transporting, and depositing loads. 4,049,143, Cl. 214-390.000.
Hatswell, John Sidney: *See*—
Sloboda, Mieczyslaw Herman; and Hatswell, John Sidney, 4,049,434, Cl. 75-134.00C.
Hatten, Jimmy L.: *See*—
Otto, Kenneth Wayne; and Hatten, Jimmy L., 4,049,729, Cl. 260-654.00H.
Hatterer, Andre; Oberlin, Claude; and Strobel, Pierre, to Commissariat a l'Energie Atomique. Method of fabrication of an alloy containing an alkali metal and/or an alkaline-earth metal. 4,049,443, Cl. 75-66.000.
Hattori, Torao; and Maezono, Masakazu, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for preventing faulty operation in transmission of motorcars. 4,049,101, Cl. 192-87.190.
Hause, Jonathan E., to Xerox Corporation. Stitching head bypass apparatus. 4,049,180, Cl. 227-78.000.
Haven, Lawrence F.: *See*—
Chubb, Raymond L.; Haven, Lawrence F.; and Hisey, Robert W., 4,049,064, Cl. 173-147.000.
Haviland, Diane, administratrix: *See*—
Haviland, Herbert, deceased; Haviland, Diane, administratrix; Smith, Arthur; and Boyer, Charles, 4,049,193, Cl. 236-46.00R.
Haviland, Herbert, deceased; by Haviland, Diane, administratrix; Smith, Arthur; and Boyer, Charles, to Fuel Computer Corporation. Systems and apparatus for control of fueled heat generators. 4,049,193, Cl. 236-46.00R.
Hawkins, Gary Fred; and Gass, Robert Lee, to Eastman Kodak Company. Process for producing methylene malonic esters. 4,049,698, Cl. 560-127.000.
Hawthorn Leslie (Engineers) Limited: *See*—
Crowdy, Edmund Porter; and Drentham-Susman, Hector Fillippus Alexander, 4,049,972, Cl. 290-52.000.
Hay, Robert A., II: *See*—
Smith, Hubert Stacy, Jr.; and Hay, Robert A., II, 4,049,852, Cl. 428-55.000.
Hayashi, Hideki: *See*—
Tanaka, Seiichi; Watari, Kazuhiro; and Hayashi, Hideki, 4,049,723, Cl. 260-621.00A.
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, to Maruzen Petrochemical Co. Ltd. Process for producing high-crystalline petroleum coke. 4,049,538, Cl. 208-50.000.
Hayashi, Koichiro: *See*—
Ito, Akihiko; Shimizu, Akira; and Hayashi, Koichiro, 4,049,518, Cl. 204-159.210.
Ito, Akihiko; Kaetsu, Isao; Okubo, Hiroshi; Kato, Masamichi; Hayashi, Koichiro; and Maeda, Yuji, 4,049,867, Cl. 428-412.000.
Hayashi, Nobuyuki: *See*—
Harada, Masanori; Katou, Shinzo; and Hayashi, Nobuyuki, 4,048,966, Cl. 123-117.00A.
Hayashi, Yoshimasa: *See*—
Aoyama, Tsuyoshi; Hayashi, Yoshimasa; Nagano, Michio; and Nagase, Hiroshi, 4,049,874, Cl. 428-451.000.
Hayes, William V.: *See*—
Childress, David L.; Hayes, William V.; and Poppe, Richard L., 4,049,577, Cl. 252-443.000.
Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., to Quaker Oats Company, The. High fat, fortified, marshmallow based food bar. 4,049,832, Cl. 426-72.000.
Hazemag Dr. E. Andreas Kg: *See*—
Konig, Rolf; Nordemann, Bernhard; and Motek, Herbert, 4,049,206, Cl. 241-73.000.
Hearon, Guy Head, to Dymat Photomatrix Corporation. Microfiche cartridge and transport apparatus. 4,049,342, Cl. 353-27.00R.
Heberlein Maschinenfabrik AG: *See*—
Ritter, Helmut, 4,048,864, Cl. 74-230.17F.
Heckert, David Clinton, to Procter & Gamble Company, The. Detergent compositions containing internal vicinal disulfates. 4,049,585, Cl. 252-531.000.
Hedgewick, Peter: *See*—
Suhr, Donald C.; and Hedgewick, Peter, 4,049,148, Cl. 215-214.000.
Hedrich, Wilhelm, to Wilhelm Hedrich Vakuumanlagen, Firma. Apparatus for the high-speed mixing and degasification of viscous materials especially synthetic resin. 4,049,244, Cl. 259-185.000.
Hedstrom Co.: *See*—
Hartung, Richard S., 4,049,319, Cl. 301-1.000.
Heflinger, Lee O.: *See*—
Wuerker, Ralph F.; and Heflinger, Lee O., 4,050,035, Cl. 331-94.50C.
Heinen, Richard; and Rieger, Georg, to Dyckerhoff & Widmann Aktiengesellschaft. Apparatus for screwing a threaded nut onto a steel rod. 4,048,875, Cl. 81-125.000.
Heinl, Walter: *See*—
Freissmuth, Alfred; Heinl, Walter; Knahl, Herbert; and Pfluger, Erich, 4,049,442, Cl. 75-55.000.
Heintz, Walter K., to Ford Motor Company. Hermetically sealed alkali metal battery container. 4,049,889, Cl. 429-174.000.
Heinz, Ernst: *See*—
Bierbach, Herbert; Dittmar, Heinz; Heinz, Ernst; Hohmann, Klaus; and Rennhack, Rolf, 4,049,788, Cl. 423-592.000.
Heinz, Gerhard: *See*—
Falkenstein, Georg; Stein, Dieter; Haaf, Franz; Heinz, Gerhard; and Schoen, Ernst, 4,049,590, Cl. 260-2.5BE.
Heinz, Kurt Erich; and Klassen, Horst Willi, to Girling Limited. Friction pad assemblies for sliding caliper disc brakes. 4,049,087, Cl. 188-73.500.
Helms, Charles Carlyle, to Perkin-Elmer Corporation, The. Ozone absorbance controller. 4,049,987, Cl. 313-112.000.
Hemphill, J. Barry, to United States Steel Corporation. Method for the homogeneous distribution of alloys in molten steel using oil and water mixtures. 4,049,433, Cl. 75-129.000.
Hempstead, Robert Douglas: *See*—
Ainslie, Norman George; Hempstead, Robert Douglas; Tan, Swie-In; and Valstyn, Erich Philipp, 4,049,522, Cl. 204-192.00M.
Henley, Virgil E., to General Tire & Rubber Company, The. Rubber strip guide apparatus. 4,049,486, Cl. 156-405.00R.
Hennessey, Richard G.: *See*—
Beemer, Richard B.; and Hennessey, Richard G., 4,049,084, Cl. 188-1.00A.
Henry, Philip D. Rapid separation of plasma creatine kinase isoenzymes. 4,049,496, Cl. 195-66.00R.

Henry, Ralph Eugene, to Dresser Industries, Inc. Combination excess flow and disconnect shutoff valve fitting. 4,049,016, Cl. 137-498.000.

Henry Valve Company: *See—*
Jones, Evan, 4,049,017, Cl. 137-540.000.

Herb, Samuel F.: *See—*
Luddy, Francis E.; Hampson, James W.; and Herb, Samuel F., 4,049,839, Cl. 426-607.000.

Herman, Edwin Bernard: *See—*
Haas, Gerhard Julius; and Herman, Edwin Bernard, 4,049,835, Cl. 426-106.000.

Hermanson, Herman A., to Xerox Corporation. Combination imaging and grounding roller. 4,049,343, Cl. 355-3.00P.

Hernandez, Armando C.; and Prohoroff, Jack P. Filtering apparatus for cigarette smokers. 4,049,005, Cl. 131-187.000.

Herr, John A.: *See—*
Odermann, Charles R.; Peterson, Wesley R.; Herr, John A.; and Porter, Oswald M., 4,048,932, Cl. 112-158.00E.

Herrig, Klaus: *See—*
Wener, Kurt; Stock, Gunter; Herrig, Klaus; and Wagner, Heinz, 4,049,224, Cl. 245-6.000.

Hertz, Carl Hellmuth; and Welinder, Jan Birger Franz. Ink jet method and apparatus. 4,050,075, Cl. 346-75.000.

Herzl, Peter J., to Fischer & Porter Co. System for determining the ratio of oil to water in a metered fluid stream. 4,048,854, Cl. 73-194.0VS.

Hess, Wolfgang, to Girling Limited. Brake pressure control valves with fluid pressure responsive valve. 4,049,323, Cl. 303-6.00C.

Hewes, William Stan. Paraffin cleaner. 4,049,057, Cl. 166-304.000.

Hewlett-Packard Company: *See—*
Ligon, Thomas R., 4,049,477, Cl. 148-187.000.
Maitland, David Steven, 4,049,980, Cl. 307-304.000.

Heyman, Klas, to AB Gotaverken. Cargo carrying vessel having at least one cargo carrying deck. 4,048,937, Cl. 114-72.000.

Hi-Speed Checkweigher Co., Inc.: *See—*
Kavanagh, George; and Caron, John L., 4,049,068, Cl. 177-25.000.

Hieber, Konrad: *See—*
Politycki, Alfred; and Hieber, Konrad, 4,048,954, Cl. 118-49.100.

Hijikata, Akiko: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,049,645, Cl. 260-239.00B.

Hilbert, Samuel D.: *See—*
Gilkey, Russell; Hilbert, Samuel D.; and Wicker, Thomas H., Jr., 4,049,621, Cl. 260-40.000.

Hiles, Maurice Arthur Frederick, to National Research Development Corporation. Molded abrasive article comprising non-foamed, friable polyurethane and process. 4,049,396, Cl. 51-295.000.

Hilliges, Friedrich: *See—*
Konig, Justus; Rohrig, Josef; and Hilliges, Friedrich, 4,049,922, Cl. 179-18.0AB.

Hindermann, Peter; and Meindl, Hubert, to Ciba-Geigy AG. Fibre-reactive anthraquinone dyestuffs. 4,049,656, Cl. 260-256.50R.

Hinz, Henry: *See—*
Carlsson, Ernest R., Jr.; Delach, Henry; and Hinz, Henry, 4,049,277, Cl. 273-145.00C.

Hirzy, John William, to Monsanto Company. Modified polyester polyblends and preparation thereof. 4,049,611, Cl. 260-31.600.

Hisey, Robert W.: *See—*
Chubb, Raymond L.; Haven, Lawrence F.; and Hisey, Robert W., 4,049,064, Cl. 173-147.000.

Hitachi, Ltd.: *See—*
Horie, Noboru, 4,049,476, Cl. 148-175.000.
Kato, Kanji; Goto, Tatsuo; and Inoyama, Tadao, 4,048,687, Cl. 10-155.00R.
Kera, Kazuo; Kubo, Yutaka; and Ihara, Hirokazu, 4,049,957, Cl. 235-153.0AK.
Manabe, Toshikatsu; Ohta, Masao; Kudo, Tetsuichi; Mochizuki, Shouji; and Gejyo, Tetsuo, 4,049,789, Cl. 423-593.000.
Yamada, Takahiro; and Doi, Tetsuo, 4,050,077, Cl. 346-75.000.

Ho, William W.: *See—*
Burton, C. Shepherd; Harker, Alan B.; and Ho, William W., 4,049,383, Cl. 23-232.00E.

Hobart Corporation: *See—*
Fullenkamp, Anthony L.; and Russell, Herman F., 4,048,689, Cl. 15-3.170.

Hobbs, James C., II. Solar heater. 4,048,981, Cl. 126-271.000.

Hochtief A.G.: *See—*
Stuckmann, Dieter; Babendererde, Siegmund; Jutte, Hans; and Bokemeyer, Reinhard, 4,048,806, Cl. 61-85.000.

Hodgins, Howard A., to Rochester Button Company, The. Style loop forming and attaching apparatus. 4,048,931, Cl. 112-121.270.

Hodgson, Clive, to Chevron Research Company. Particulate ammonium nitrate with added ferric phosphate and calcium sulfate. 4,049,778, Cl. 423-265.000.

Hoechst Aktiengesellschaft: *See—*
Bach, Josef; Kollwig, Horst; Meitzner, Wolfgang; Weintritt, Horst; and Ueberdiek, Ralf, 4,049,209, Cl. 242-18.0PW.
Kunstmann, Rudolf; and Kaiser, Joachim, 4,049,655, Cl. 424-248.500.

Hoesch Werke Aktiengesellschaft: *See—*
Fabian, Wolfgang; Klein, Konrad; and Sevenich, Theodor, 4,048,831, Cl. 72-251.000.

Hoffend, Thomas A.: *See—*
Azar, Jack C.; Hoffend, Thomas A.; and Jacknow, Burton B., 4,049,447, Cl. 96-1.0SD.

Hoffman-La Roche Inc.: *See—*
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,049,666, Cl. 260-294.80R.
Hajos, Zoltan George, 4,049,677, Cl. 260-340.9AS.

Hoffmann & Engelmann: *See—*
Armbrust, Ludwig; and Neubert, Jurgen, 4,049,860, Cl. 428-201.000.

Hoffmann-La Roche Inc.: *See—*
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,049,667, Cl. 260-294.80R.

Hofmeister, Helmut: *See—*
Laurent, Henry; Annen, Klaus; Wiechert, Rudolf; and Hofmeister, Helmut, 4,049,804, Cl. 424-242.000.

Hoganas AB: *See—*
von Scheele, Gert H., 4,049,436, Cl. 75-.50R.

Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, to Aktiebolaget Leo. Method, composition and compounds for treating excess prostaglandins. 4,049,799, Cl. 424-211.000.

Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, to Aktiebolaget Leo. Method, composition and compounds for treating excess prostaglandins. 4,049,800, Cl. 424-211.000.

Hohmann, Klaus: *See—*
Bierbach, Herbert; Dittmar, Heinz; Heinz, Ernst; Hohmann, Klaus; and Rennhack, Rolf, 4,049,788, Cl. 423-592.000.

Hoke, Clyde Rockwell. Sod cutter. 4,049,060, Cl. 172-19.000.

Holan, George: *See—*
Evans, John James Alexander; and Holan, George, 4,049,815, Cl. 424-269.000.

Holcombe, Cressie E., Jr. Loop-the-hoop exerciser. 4,049,264, Cl. 272-74.000.

Hole, Richard A. Board game apparatus. 4,049,276, Cl. 273-134.0AC.

Holliday, Robert E.: *See—*
Albers, Kenneth H.; and Holliday, Robert E., 4,049,602, Cl. 260-27.00R.

Holt, Brian; and Randell, Donald Richard, to Ciba-Geigy Corporation. Bis piperidyl carboxylates. 4,049,647, Cl. 542-426.000.

Holzermer, Gunther: *See—*
Berger, Helmut; Holzermer, Gunther; Kirsch, Harry; and Vijlbrief, Pieter, 4,049,967, Cl. 250-445.00T.

Honda, Fumio; Taki, Tsuneo; and Kajiwara, Masatoshi, to Murata Manufacturing Co., Ltd. Holding device for electrical and electronic parts. 4,049,118, Cl. 206-330.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Hattori, Torao; and Maezono, Masakazu, 4,049,101, Cl. 192-87.190.

Honda, Zenzo: *See—*
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Honeywell Information Systems, Inc.: *See—*
Miu, Ming T.; Negi, Virendra S.; and Lemay, Richard A., 4,050,097, Cl. 364-200.000.

Hong, Henry Y-P; and Goodenough, John B., to Massachusetts Institute of Technology. Compositions for fast alkali-metal-ion transport. 4,049,891, Cl. 429-193.000.

Honjo, Satoru; and Takimoto, Masaaki, to Fuji Photo Film Co., Ltd. Process for producing an electrophotographic material in which a pinhole-filling dispersion is employed. 4,049,448, Cl. 96-1.50R.

Honny Chemicals Company, Ltd.: *See—*
Edie, Dennis L., 4,049,875, Cl. 428-462.000.

Hood, Charles B., to Chardon Laboratories, Inc. Thermally-responsive liquid dispenser. 4,049,156, Cl. 222-54.000.

Hood, Robert Allen: *See—*
Birney, Richard Eugene; and Hood, Robert Allen, 4,050,060, Cl. 364-200.000.

Hooker Chemicals & Plastics Corporation: *See—*
Fuller, Willard A., 4,049,784, Cl. 423-478.000.
Fuller, Willard A., 4,049,785, Cl. 423-478.000.
Gelfand, Samuel, 4,049,727, Cl. 260-650.00R.
Pawlak, Joseph A.; Lemper, Anthony L.; and Pattison, Victor A., 4,049,629, Cl. 260-47.00C.
Thorpe, Donald H., 4,049,749, Cl. 260-862.000.

Hoover Ball and Bearing Company: *See—*
Young, David A., 4,049,288, Cl. 280-406.00A.

Hoover, William R.; Mead, Keith E.; and Street, Henry K., to United States of America, Energy Research and Development Administration. Penetration resistant barrier. 4,049,864, Cl. 428-332.000.

Hori, Yutaka; Honda, Zenzo; Suzuki, Kenji; Nakamoto, Keiji; and Yamamoto, Yoshiharu, to Nitto Electric Industrial Co., Ltd. Plastic laminated metallic foil and method for preparing the same. 4,049,904, Cl. 174-107.000.

Horie, Noboru, to Hitachi, Ltd. Method of manufacturing a semiconductor integrated circuit device which includes at least one V-groove jfet and one bipolar transistor. 4,049,476, Cl. 148-175.000.

Hornle, Reinhold: *See—*
Perrey, Hermann; Schulze, Jurgen; Rosenkranz, Hans Jurgen; Rudolph, Hans; and Hornle, Reinhold, 4,049,378, Cl. 8-87.000.

Hornyak, Maria: *See—*
Schawartz, Jozsef; Hornyak, Maria; Majorszki, Eva; David, Agoston; and Horvath, Gabor, 4,049,639, Cl. 260-140.000.

Horowitz, Harold S.; and Longo, John M., to Exxon Research & Engineering Co. Layered manganese compound of the formula $CA_2MN_3O_8$. 4,049,790, Cl. 423-599.000.

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Schawartz, Jozsef; Hornyak, Maria; Majorszki, Eva; David, Agoston; and Horvath, Gabor, 4,049,639, Cl. 260-140.000.

Horvath, Peter J., to Carvalho, Rocky. Chemical waste water treatment method. 4,049,545, Cl. 210-28.000.

Hosaka, Hirokazu; Tanimoto, Kenji; and Yamachika, Hiroshi, to Sumitomo Chemical Company, Limited. Process for producing β-isopropyl-naphthalene hydroperoxide. 4,049,720, Cl. 260-610.00B.
Hotten, Bruce W., to Chevron Research Company. Lubricant compositions. 4,049,561, Cl. 252-46.700.
Hotten, Bruce W., to Chevron Research Company. Extreme pressure lubricant compositions. 4,049,562, Cl. 252-46.700.
Houba, Roger: *See—*
Lorge, Michel; and Houba, Roger, 4,049,761, Cl. 264-89.000.
Houf, Robert Henry, Jr., to Motorola, Inc. Crescent silencing reset mechanism for fast forward 8-track cartridge. 4,049,169, Cl. 226-47.000.
Houska, Jaroslaw, to BBC Brown Boveri & Company, Limited. $SECo_5$-Permanent magnet joined to at least one iron mass and method of fabricating such a permanent magnet. 4,049,475, Cl. 148-101.000.
Houslay, Ralph John Gilbert, to Imperial Chemical Industries Limited. Residual solvent removed from chlorinated polymers. 4,049,897, Cl. 528-483.000.
Hovey, Richard J., to American Optical Corporation. Photochromic plastic materials. 4,049,846, Cl. 427-164.000.
Howard, Byron W. Chain saw attachment. 4,048,722, Cl. 30-386.000.
Howell, James D., to Exxon Production Research Company. Drill spring tension limiting device for floating drilling vessels. 4,049,239, Cl. 254-172.000.
Huang, Tracy J.: *See—*
Yan, Tsoung Y.; Huang, Tracy J.; and Haag, Werner O., 4,049,539, Cl. 208-65.000.
Hubert, Warren N., to Dixico Inc. Container head forming. 4,048,933, Cl. 113-1.00B.
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de Ronde, Henry Marinus, 4,049,902, Cl. 174-35.00C.
Garvin, Hugh L.; Yariv, Amnon; and Somekh, Sasson, 4,049,944, Cl. 219-121.0EM.
Prince, Paul R.; Skehan, Bernard J.; and Hansen, Jay M., 4,050,085, Cl. 358-219.000.
Hughes, Dorothy: *See—*
Nicklin, Thomas; and Hughes, Dorothy, 4,049,776, Cl. 423-226.000.
Hughes, Thomas R.: *See—*
Gibson, Kirk R.; Hughes, Thomas R.; and Jacobson, Robert L., 4,049,542, Cl. 208-213.000.
Hulsebusch, Karl-Heinz, to Klockner-Humboldt-Deutz Aktiengesellschaft. Change gear transmission for motor vehicles, especially for use in agriculture and construction. 4,048,870, Cl. 74-473.00R.
Hunsucker, Jerry H., to IMC Chemical Group, Inc. Method of combatting microorganisms employing substituted oxazolines. 4,049,819, Cl. 424-272.000.
Hunt Manufacturing Co.: *See—*
Alexander, Robert L., 4,049,127, Cl. 211-189.000.
Hunt, Ronald Eugene: *See—*
Church, John Allen; Feinstein, Paul, Jr.; Hunt, Ronald Eugene; McDaniels, Louis Marion; and Munch, Paul Francis, 4,049,256, Cl. 271-9.000.
Hunter, Wood E.; and Sieder, Theodore P., to Nalco Chemical Company. Preparation of a manniched polyacrylamide quarternaries thereof. 4,049,606, Cl. 260-29.4UA.
Huntt, Robert L. Glass bonding of manganese-zinc ferrite. 4,048,714, Cl. 29-603.000.
Hurlburt, Joseph C.; Brown, Howard R.; and Buck, Ernest E., to Sperry Rand Corporation. Linkage for controlling two independent power units. 4,048,862, Cl. 74-57.000.
Hurson, James Kevin. Surgical acid. 4,048,987, Cl. 128-20.000.
Hurst, John W., to Chrysler Corporation. Clutch shifting mechanism. 4,049,102, Cl. 192-93.00R.
Husges, Gerd, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Flyer bobbin. 4,049,215, Cl. 242-125.100.
Hutson, Thomas, Jr.: *See—*
Kraus, Wayne P.; and Hutson, Thomas, Jr., 4,049,728, Cl. 260-653.600.
Hvass, Mogens. Method of making compact electric coils. 4,048,713, Cl. 29-594.000.
Hwang, Yun Sheng: *See—*
Dru, Luke William; and Hwang, Yun Sheng, 4,049,978, Cl. 307-270.000.
Hyman, David L.; Cayton, Robert J.; and Rosenquist, Kurt E., to Louverdrape, Inc. Louvered covering system. 4,049,038, Cl. 160-166.00A.
Ichiro Miyakita: *See—*
Miyakita, Hiroshi; and Miyakita, Ichiro, 4,048,885, Cl. 83-38.000.
ICI United States Inc.: *See—*
Restaino, Alfred Joseph, 4,049,731, Cl. 260-666.500.
Ideal Toy Corporation: *See—*
Carlsson, Ernest R., Jr.; Delach, Henry; and Hinz, Henry, 4,049,277, Cl. 273-145.00C.
Identicar Corporation of America: *See—*
Peck, Gregory George Alexander, 4,048,918, Cl. 101-114.000.
Ihara, Hirokazu: *See—*
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Ikeda, Toshiki; Yamai, Fumito; and Ishida, Tomohiko, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Process for preparing expandable styrene polymer particles. 4,049,594, Cl. 260-2.50B.
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Saari, Oliver Edward, 4,048,867, Cl. 74-424.80B.
Ilyes, Zoltan: *See—*
Bole, Karoly; Nagy, Kalman; Aufsatz, Istvan; Bohnert, Jozsef; Branyi, Laszlo; Ilyes, Zoltan; Korbuly, Jozsef; and Nemeth, Janos, 4,048,803, Cl. 61-45.00D.
IMC Chemical Group, Inc.: *See—*
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Wehrmeister, Herbert Louis, 4,049,810, Cl. 424-258.000.
Imhoff, William B., to Leigh Products, Inc. Self-latching flush bolt. 4,049,304, Cl. 292-333.000.
Immco Industries, Inc.: *See—*
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Immel, Guenther: *See—*
Eisentraeger, Klaus; Immel, Guenther; Marx, Matthias; Reinhard, Hans; Spoor, Herbert; and Storck, Gerhard, 4,049,847, Cl. 427-207.00B.
Imperial Chemical Industries Limited: *See—*
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Houslay, Ralph John Gilbert, 4,049,897, Cl. 528-483.000.
McLoughlin, Bernard Joseph; and Guildford, Allen John, 4,049,808, Cl. 424-248.400.
McOnie, Malcolm Peter; Tucker, Anthony John Philip; and van Lienden, Peter Willem, 4,049,895, Cl. 526-62.000.
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Ingersoll-Rand Company: *See—*
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Inno-Cept Corporation: *See—*
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Inoue, Yasuhiko; and Uyeo, Keizo, to Sumitomo Chemical Company, Limited. Method for activation of aluminum chloride complex alkylation catalyst. 4,049,740, Cl. 260-671.00R.
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Institute po Metalosnanie i Technologia na Metalite pri Ban: *See—*
Nikolov, Ivan Dimov; Kortenski, Hristo Georgiev; Dimitrov, Dimiter Tanev; and Antonov, Asparuh Mihaylov, 4,049,041, Cl. 164-120.000.
Institute po Zavaryavane: *See—*
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Petrov, Peter Dimitrov; and Punchev, Simeon Georgiev, 4,049,172, Cl. 226-90.000.
Instytut Wlokien Chemicznych: *See—*
Majewska, Janina; Grams, Wiktor; Rybicki, Zbigniew; and Banasiak, Jozef, 4,049,775, Cl. 423-224.000.
Intercontinental Plastics Mfg. Co.: *See—*
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International Business Machines Corporation: *See—*
Ainslie, Norman George; Hempstead, Robert Douglas; Tan, Swie-In; and Valstyn, Erich Philipp, 4,049,522, Cl. 204-192.00M.
Birney, Richard Eugene; and Hood, Robert Allen, 4,050,060, Cl. 364-200.000.
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Church, John Allen; Feinstein, Paul, Jr.; Hunt, Ronald Eugene; McDaniels, Louis Marion; and Munch, Paul Francis, 4,049,256, Cl. 271-9.000.
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Hammer, Robert, 4,049,857, Cl. 428-136.000.
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Kollar, Ernest P., 4,050,090, Cl. 360-130.000.
International Flavors & Fragrances Inc.: *See—*
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,049,682, Cl. 260-410.000.
International Harvester Company: *See—*
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International Minerals & Chemical Corporation: *See—*
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International Nickel Company, Inc., The: *See—*
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Donachie, Stephen James, 4,049,429, Cl. 75-246.000.
Sridhar, Ramamrithan; Warner, John Stuart; and Bell, Malcolm Charles Evert, 4,049,438, Cl. 75-21.000.
International Paper Company: *See—*
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,049,491, Cl. 162-101.000.
International Standard Electric Corporation: *See—*
Dartois, Jean-Pierre Andre, 4,049,923, Cl. 179-18.0GE.
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International Tools (1973) Ltd.: *See—*
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Interpace Corporation: *See—*
Valenziano, Frank P.; and Olivier, Daniel E., 4,048,779, Cl. 52-726.000.

INTERx Research Corporation: *See—*
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Irwin, George; and Butler, Gary, to Brammall, Inc. Cable loc with dimple along fixed end of cable to assure integrity of seal. 4,049,303, Cl. 292-307.00R.

Isayama, Takuro; and Kubo, Kikuo, to Ricoh Company, Ltd. Automatic nozzle cleaning system for ink ejection printer. 4,050,078, Cl. 346-140.00R.

Ishida, Tomohiko: *See—*
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Ishii, Hirohisa; and Shishikura, Masami, to Sony Corporation. Electric motor. 4,049,984, Cl. 310-42.000.

Ishii, Masayoshi: *See—*
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.

Ishizuka, Masaaki: *See—*
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ISIS Chemicals, Inc.: *See—*
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Isnard, Theophile, to Caterpillar France S.A. Apparatus utilizing a test surface with a magnetic flux gap for detecting dimensional disconformities of manufactured elements. 4,050,010, Cl. 324-34.00R.

Itani, Fujio: *See—*
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Ito, Akihiko; Shimizu, Akira; and Hayashi, Koichiro, to Japan Atomic Energy Research Institute. Multi-step radiation process of producing polyoxymethylenes. 4,049,518, Cl. 204-159.210.

Ito, Akihiko; Kaetsu, Isao; Okubo, Hiroshi; Kato, Masamichi; Hayashi, Koichiro; and Maeda, Yuji, to Japan Atomic Energy Research Institute; and Tokyo Optical Company, Ltd. Thermosetting resin composition comprising an [(2,3-epoxypropoxy)alkyl]trialkyloxysilane. 4,049,867, Cl. 428-412.000.

Ito, Shiro Tom: *See—*
Laing, Graham Stirling; and Ito, Shiro Tom, 4,049,925, Cl. 179-99.000.

Ito, Shozo, to Mifuji Iron Works Co., Ltd. Method for treating raw material with a treating gas. 4,049,395, Cl. 48-197.00R.

Ito, Tadashi; Wakahara, Katuhiro; and Tatsuoka, Masao, to Sharp Kabushiki Kaisha. Combination of air conditioner and ventilating unit provided with total heat exchanger assembly. 4,048,811, Cl. 62-263.000.

Ito, Yuzuru, to Kabushiki Kaisha Daini Seikosha. Solid electrolyte cell. 4,049,468, Cl. 429-193.000.

Itoh, Takuji; Nishikawa, Eiichiroh; Miura, Tadashi; and Yamahata, Takashi, to Toa Nenryo Kogyo Kabushiki Kaisha. Method for preparing hydrocarbon conversion catalyst using acid amide solutions to impregnate a tin component. 4,049,581, Cl. 252-466.0PT.

Iversen, Bjorn, to Simon Container Machinery Limited. Corrugating machinery. 4,049,485, Cl. 156-351.000.

Izon Corporation: *See—*
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J. I. Case Company: *See—*
Johnson, Donald L., 4,048,869, Cl. 74-471.00R.

Jablonski, Werner: *See—*
Mallek, Heinz; Jablonski, Werner; and Augustin, Friedhelm, 4,048,927, Cl. 110-8.00R.

Jacknow, Burton B.: *See—*
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Jaco, Charles M., Jr.; Menear, Wallace C.; and Clark, Donald W., to Midrex Corporation. Method of extending the life of a catalyst in a process of producing metallic iron pellets. 4,049,441, Cl. 75-35.000.

Jacob, Solomon M.: *See—*
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Jacobson, John D. Chair having independent seat and back. 4,049,315, Cl. 297-447.000.

Jacobson, Robert L.: *See—*
Gibson, Kirk R.; Hughes, Thomas R.; and Jacobson, Robert L., 4,049,542, Cl. 208-213.000.

Jacoby, Jerold L.; Tierney, William S.; Wright, James E.; and Bhuta, Pravin G., to TRW Inc. Pulsed holographic system having independent universal beam adjustment. 4,049,336, Cl. 350-3.500.

Jaeggi, Knut A.; Schroter, Herbert; and Ostermayer, Franz, to Ciba-Geigy Corporation. Composition and method for treatment of heart and circulatory ailments. 4,049,797, Cl. 424-180.000.

Jager, Horst, to Bayer Aktiengesellschaft. 2-Amino-1-sulfonaphthalene containing acylaminomethyl substituent. 4,049,704, Cl. 260-507.00R.

James, Barrie Sydney: *See—*
Such, Tony Eugene; Wyszynski, Apoloniusz; and James, Barrie Sydney, 4,049,509, Cl. 204-49.000.

Janikowski, Stanislaw Maria: *See—*
Harper, Douglas Charles; Robinson, Norman; and Janikowski, Stanislaw Maria, 4,049,774, Cl. 423-167.000.

Janssen, Jos M., to JMJ Werkzeugmaschinen GmbH fuer Feinbearbeitung. Method for surface-, plane-parallel-, and plain lapping. 4,048,763, Cl. 51-281.0SF.

Japan Atomic Energy Research Institute: *See—*
Ito, Akihiko; Shimizu, Akira; and Hayashi, Koichiro, 4,049,518, Cl. 204-159.210.
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Japan Exlan Company Limited: *See—*
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Jarvis, Alfred John: *See—*
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Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., to Cutler-Hammer, Inc. Integrated thermally sensitive power switching semiconductor device, including a thermally self-protected version. 4,050,083, Cl. 357-28.000.

Jawdoszyn, Claude, to Neiman, S.A. Safety device for a rotary starter switch for an automobile vehicle. 4,049,932, Cl. 200-44.000.

Jaworski, Eugene: *See—*
Breslow, Jeffrey D.; and Jaworski, Eugene, 4,049,272, Cl. 273-95.00R.

Jeffrey, William B., to Westinghouse Air Brake Company. Control system for automatic railway car coupler. 4,049,128, Cl. 213-1.600.

Jehlicka, Roger F., to General Electric Company. Method of making electrical connections. 4,048,716, Cl. 29-628.000.

Jencks, Guy S. D.: *See—*
Cotton, Charles C.; and Jencks, Guy S. D., 4,048,942, Cl. 114-253.000.

Jenkins, Jimmie M. Flute breaker. 4,048,977, Cl. 125-23.00R.

Jenkins, William A., to Monarch Marking Systems, Inc. Tag attaching apparatus. 4,049,176, Cl. 227-67.000.

Jenkins, William A., to Monarch Marking Systems, Inc. Tag attaching apparatus. 4,049,179, Cl. 227-67.000.

Jensen, Reed J.: *See—*
Robinson, C. Paul; Rockwood, Stephen D.; Jensen, Reed J.; Lyman, John L.; and Aldridge, Jack P., III, 4,049,515, Cl. 204-157.10R.

Jepsen, Robert E., to Air Products and Chemicals, Inc. Piston ring. 4,048,909, Cl. 92-194.000.

Jevons, Cecil F. Motorcycle team racing game. 4,049,274, Cl. 273-134.0CA.

Jin, Jung Il; and Kraft, Paul, to Stauffer Chemical Company. Cross-linked vinyl halide polymers as flame retardant additives for thermoplastics. 4,049,747, Cl. 260-859.0PV.

JMJ Werkzeugmaschinen GmbH fuer Feinbearbeitung: *See—*
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Johansen, Poul Egon, to Portion Packaging Limited. Process for the production of a product filled container. 4,048,781, Cl. 53-30.00R.

John D. Brush & Co., Inc.: *See—*
Brush, John D., Jr.; and Burgess, George M., 4,048,926, Cl. 109-65.000.

John Pierce Co., Inc., The: *See—*
Pierce, John H., 4,049,210, Cl. 242-18.00R.

Johns-Manville Corporation: *See—*
Woidke, Richard Paul; Wester, Thomas Joseph; and Brosch, Eric Joseph, 4,048,861, Cl. 74-56.000.

Johnson, Arthur C. W., to Combustion Research Corporation. Ventilation system with thermal energy recovery. 4,049,404, Cl. 55-387.000.

Johnson, Donald L., to J. I. Case Company. Shifting mechanism for control elements. 4,048,869, Cl. 74-471.00R.

Johnson, Eloise: *See—*
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Johnson, Gary L.; and Zoya, Walter J., to Sperry Rand Corporation. Power transmission. 4,049,014, Cl. 137-315.000.

Johnson & Johnson: *See—*
Tritsch, Ludwig, 4,049,001, Cl. 128-287.000.

Johnson, Lloyd D.: *See—*
Raudat, John L.; and Johnson, Lloyd D., 4,048,783, Cl. 53-61.000.

Johnson, Martin Robert, to Ridley, Spriggs and Johnson Limited. Knitted garments. 4,048,819, Cl. 66-177.000.

Johnson, Matthey & Co., Limited: *See—*
Priest, John Garrick; and Tooth, Robert Barry, 4,049,484, Cl. 156-285.000.
Sloboda, Mieczyslaw Herman; and Hatswell, John Sidney, 4,049,434, Cl. 75-134.00C.

Johnson, Robert B.: *See—*
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Johnson, Tony: *See—*
Stevens, Henry H., 4,048,873, Cl. 81-3.00R.

Jolivet, Jean-Claude; and Stouls, Francois-Xavier, to Societe Anonyme de Telecommunications. Digital signal transmission system. 4,049,910, Cl. 178-69.100.

Jones, Allen, Jr. Free-flooding chamber structuremountable on the underside of a watercraft. 4,048,939, Cl. 114-125.000.

Jones, Clifford P.: *See—*
Estebanez, Joseph; Harrison, David V.; Jones, Clifford P.; and Wilson, Henry G. E., 4,048,956, Cl. 118-306.000.

Jones, Evan, to Henry Valve Company. Adjustable relief valve. 4,049,017, Cl. 137-540.000.

Joseph Lucas Limited: *See—*
Boxer, Trevor Charles, 4,049,998, Cl. 318-258.000.

Joshi, Madhukar L.: *See—*
Ghosh, Hitendra N.; Joshi, Madhukar L.; and Yeh, Tsu-Hsing, 4,049,478, Cl. 148-187.000.

Jovan, Inc.: *See*—
Mitchell, Bernard A.; and Shipp, Barry E., 4,049,010, Cl. 132-88.500.

Joyce, James E.; and Zeller, Judy A. Merchandise container. 4,049,113, Cl. 206-44.00R.

Juilfs, Donald R.: *See*—
Juilfs, Otto H.; and Juilfs, Donald R., 4,048,695, Cl. 16-65.000.

Juilfs, Otto H.; and Juilfs, Donald R. Door check and closure device. 4,048,695, Cl. 16-65.000.

Julia, Marc: *See*—
Chabardes, Pierre; Julia, Marc; and Menet, Albert, 4,049,718, Cl. 260-590.00C.

Julian, Kenneth A.: *See*—
Julian, Victor J.; and Julian, Kenneth A., 4,049,335, Cl. 339-224.000.

Julian, Victor J.; and Julian, Kenneth A. Sealed battery threaded stud termination. 4,049,335, Cl. 339-224.000.

Jurd, Leonard, to United States of America, Agriculture. Polybutyl-2-cinnamylphenols as insect anti-procreants. 4,049,722, Cl. 260-619.00R.

Jutte, Hans: *See*—
Stuckmann, Dieter; Babendererde, Siegmund; Jutte, Hans; and Bokemeyer, Reinhard, 4,048,806, Cl. 61-85.000.

K.A.L. Manufacturing Corporation: *See*—
Pratt, Wayne F., 4,049,943, Cl. 219-74.000.

K-Jack Engineering Company, Inc.: *See*—
Chalabian, Jack S., 4,049,106, Cl. 194-1.00B.

Kabushiki Kaisha Daini Seikosha: *See*—
Ito, Yuzuru, 4,049,468, Cl. 429-193.000.

Kabushiki Kaisha Seikosha: *See*—
Yanagisawa, Takeshi; and Osuga, Motoyuki, 4,050,066, Cl. 340-388.000.

Kabushiki Kaisha Takuma: *See*—
Sakakibara, Kaichi; and Sumida, Hiroyuki, 4,048,852, Cl. 73-193.00R.

Kadar, Ferenc; and Galambos, Gyula, to REMIX Radiotechnikai Vallalat. Electric slider. 4,050,051, Cl. 338-202.000.

Kaeding, Warren W., to Mobil Oil Corporation. Zeolite catalyst containing oxide of boron or magnesium. 4,049,573, Cl. 252-432.000.

Kaetsu, Isao: *See*—
Ito, Akihiko; Kaetsu, Isao; Okubo, Hiroshi; Kato, Masamichi; Hayashi, Koichiro; and Maeda, Yuji, 4,049,867, Cl. 428-412.000.

Kaiser, Joachim: *See*—
Kunstmann, Rudolf; and Kaiser, Joachim, 4,049,655, Cl. 424-248.500.

Kajima Corporation: *See*—
Sato, Kuniaki, 4,048,776, Cl. 52-297.000.

Kajiwara, Masatoshi: *See*—
Honda, Fumio; Taki, Tsuneo; and Kajiwara, Masatoshi, 4,049,118, Cl. 206-330.000.

Kajlich, Anton J. Turbulence inhibitors. 4,048,677, Cl. 4-172.000.

Kakuda, Tsutomu: *See*—
Sato, Hiroshi; Okumura, Munehiro; Itani, Fujio; Fujii, Shouji; Kakuda, Tsutomu; and Nakatui, Hiroshi, 4,049,593, Cl. 260-2.50E.

Kallen, George Harold, to Union Carbide Corporation. Line edge follower. 4,049,962, Cl. 250-202.000.

Kametaki, Shigemasa. Automatic nailing machine. 4,049,181, Cl. 227-113.000.

Kaminski, James J.: *See*—
Bodor, Nicolae S.; and Kaminski, James J., 4,049,818, Cl. 424-272.000.

Kamlukin, Igor; and Harkness, Joseph R., to Briggs & Stratton Corporation. Rotary power mower with improved clutch and brake mechanism. 4,048,788, Cl. 56-11.300.

Kamm, Lawrence J. Manufacturing machine. 4,049,500, Cl. 198-345.000.

Kammann, Wilfried; and Keller, Manfred, to Werner Kammann Maschinenfabrik. Apparatus for screen printing images on objects. 4,048,914, Cl. 101-35.000.

Kammel, Gernot; and Wiedenmann, Rudolf, to Siemens Aktiengesellschaft. Process for the production of shaped bodies from polyolefins. 4,049,757, Cl. 264-22.000.

Kamyr Incorporated: *See*—
Kindersley, Peter G., 4,049,105, Cl. 193-31.00R.

Kaneko, Norio: *See*—
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.

Kanner, Bernard; and Prokai, Bela, to Union Carbide Corporation. Sulfolanyl-bearing organosilicone polymers. 4,049,674, Cl. 260-332.100.

Kanner, Bernard; and Prokai, Bela, to Union Carbide Corporation. Sulfolanyloxy alkyl-polyalkyl-siloxanes. 4,049,675, Cl. 260-332.100.

Kanten, H. Gordon: *See*—
Peerman, Dwight E.; Swan, Dale G.; and Kanten, H. Gordon, 4,049,598, Cl. 260-18.00N.

Kanzaka, Yoshihiro, to Yoshida Kogyo Kabushiki Kaisha. Slider for slide fastener. 4,048,699, Cl. 24-205.14R.

Kapitonov, Viktor Pavlovich: *See*—
Zakharov, Evegny Dmitrievich; Shneider, Gennady Lvovich; Valkov, Viktor Dmitrievich; Kapitonov, Viktor Pavlovich; Miklyaev, Petr Grigorievich; Lebedev, Vladimir Alexandrovich; Kholnova, Vera Ivanovna; Shesterikov, Stanislav Alexeevich; and Bobrovsky, Vasily Mikhailovich, 4,049,474, Cl. 148-32.500.

Karl Gutmann KG.: *See*—
Gutmann, Karl, Jr., 4,049,331, Cl. 312-203.000.

Kasatkin, Alexei Fedoseevich; Smirnov, Jury Vasilievich; and Feldman, Ilya Afanasievich. Ribbon loudspeaker achieves focusing and uniformity of the magnetic flux in the working gap. 4,049,926, Cl. 179-115.00V.

Kasyan, Vladimir Khrisanfovich: *See*—
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.

Kato, Kanji; Goto, Tatsuo; and Inoyama, Tadao, to Hitachi, Ltd. Automatic assembly apparatus for bolts and nuts. 4,048,687, Cl. 10-155.00R.

Kato, Katsunori: *See*—
Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Kato, Katsunori, 4,049,455, Cl. 96-76.00R.

Kato, Masamichi: *See*—
Ito, Akihiko; Kaetsu, Isao; Okubo, Hiroshi; Kato, Masamichi; Hayashi, Koichiro; and Maeda, Yuji, 4,049,867, Cl. 428-412.000.

Katoh, Hidehiko: *See*—
Noguchi, Tsutomu; Akaiwa, Yoshihiko; and Katoh, Hidehiko, 4,050,038, Cl. 333-1.100.

Katona, Joseph W., to Mills Products, Inc. Microwave and radiant window for oven doors. 4,049,939, Cl. 219-10.55D.

Katou, Shinzo: *See*—
Harada, Masanori; Katou, Shinzo; and Hayashi, Nobuyuki, 4,048,966, Cl. 123-117.00A.

Kattis, Theodore. Flake ice maker. 4,048,815, Cl. 62-354.000.

Katzen, Stanley J.: *See*—
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,049,896, Cl. 526-129.000.

Kaun, Thomas D.: *See*—
Vissers, Donald R.; Nelson, Paul A.; Kaun, Thomas D.; and Tomczuk, Zygmunt, 4,048,715, Cl. 29-623.500.

Kavanagh, George; and Caron, John L., to Hi-Speed Checkweigher Co., Inc. Price labeling system with floating zero reference. 4,049,068, Cl. 177-25.000.

Kawabata, Minoru; and Takahashi, Kenji, to Toyoda-Koki Kabushiki-Kaisha. Servo valve device in power steering apparatus. 4,048,904, Cl. 91-375.00A.

Kawakami, Hiroshi; Nagaoka, Isao; and Tsukagawa, Yukio, to Bridgestone Tire Company Limited. Device for pulling up and paying out an oil boom. 4,049,170, Cl. 226-74.000.

Kawakami, Koichi; and Osaki, Tatsuo, to Yoshida Kogyo Kabushiki Kaisha. Apparatus for assembling sliders to slide fastener chain. 4,049,155, Cl. 221-192.000.

Kawazu, Takashi. Pipe coupling. 4,049,355, Cl. 403-172.000.

Kayaba Kogyo Kabushiki Kaisha: *See*—
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.

Kazantsev, Lev Seliverstovich: *See*—
Pomeschikov, Andrei Grigorievich; Buryagin, Firs Alexandrovich; Kazantsev, Lev Seliverstovich; Skvortsov, Gennady Fedorovich; Naryshkin, Jury Anatolievich; and Gracheva, Zinaida Ivanovna, 4,049,901, Cl. 13-9.0ES.

Kazin, Stephen B., to General Electric Company. Sound-attenuating inlet duct. 4,049,074, Cl. 181-286.000.

Keen, John William, to Marston Excelsior Limited. Liquid heat exchange system with separately compartmented make-up tanks. 4,049,047, Cl. 165-107.000.

Keenan, James P., to GTE Sylvania Incorporated. Tungsten halogen lamp. 4,049,988, Cl. 313-222.000.

Keisuke Honda: *See*—
Yagita, Yasunobu, 4,050,054, Cl. 340-3.00F.

Keller, Manfred: *See*—
Kammann, Wilfried; and Keller, Manfred, 4,048,914, Cl. 101-35.000.

Kelley, Buster E.: *See*—
Salonimer, David J.; and Kelley, Buster E., 4,049,969, Cl. 250-458.000.

Kellogg, William L.: *See*—
McCall, Adrian W.; and Kellogg, William L., 4,049,270, Cl. 273-95.00A.

Kelly, Warren H.: *See*—
Marsh, Norman F.; and Kelly, Warren H., 4,050,016, Cl. 324-61.00R.

Kemi Oy: *See*—
Pentti, Heikki, 4,049,850, Cl. 427-377.000.

Kemlite Corporation: *See*—
Morse, Donald B.; and Pribish, Bernard A., 4,048,887, Cl. 83-79.000.

Kendall Company, The: *See*—
Patel, Harish A., 4,049,408, Cl. 62-4.000.

Kent, Anthony John, to Matrix Engineering Limited. Forming apparatus. 4,048,841, Cl. 72-450.000.

Kera, Kazuo; Kubo, Yutaka; and Ihara, Hirokazu, to Hitachi, Ltd. Dual computer system. 4,049,957, Cl. 235-153.0AK.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Bohnenstingl, Josef; Laser, Manfred; Lossmann, Gunter; and Gebhard, Helmut, 4,049,385, Cl. 23-277.00R.

Mallek, Heinz; Jablonski, Werner; and Augustin, Friedhelm, 4,048,927, Cl. 110-8.00R.

Kerr, Ralph O.; and Barone, Bruno J., to Petro-Tex Chemical Corporation. Catalyst and process for preparing maleic anhydride from C_4 hydrocarbons. 4,049,574, Cl. 252-437.000.

Kersten, Siegfried: *See*—
Hamprecht, Gerhard; and Kersten, Siegfried, 4,049,709, Cl. 260-543.00R.

Keska, Jerzy: *See*—
Dunikowski, Andrzej; Bednarczyk, Jan; Keska, Jerzy; Pisarkiewicz, Tadeusz; and Zamarski, Andrzej, 4,048,844, Cl. 73-32.00R.

Keske, Frank E.: *See*—
Goloff, Alexander; and Keske, Frank E., 4,049,327, Cl. 308-161.000.

Kessinger, Roger L.: *See*—
United States of America, National Aeronautics and Space Administration; and Kessinger, Roger L., 4,049,930, Cl. 179-175.10A.

Keuver, Paul H. Ellipsograph. 4,048,724, Cl. 33-31.000.

Keyser, William L.: *See*—
Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., 4,049,832, Cl. 426-72.000.

KHD Industrieanlagen Ag: *See*—
Schmidt, Horst, 4,049,202, Cl. 241-30.000.

Kheifets, Robert Georgievich: *See*—
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.

Khimenko, Lev Timofeevich; and Shlyakht, Alfred Lvovich. Inductor for working metals by pressure of pulsating magnetic field. 4,049,937, Cl. 219-7.500.

Kholnova, Vera Ivanovna: *See*—
Zakharov, Evegny Dmitrievich; Shneider, Gennady Lvovich; Valkov, Viktor Dmitrievich; Kapitonov, Viktor Pavlovich; Miklyaev, Petr Grigorievich; Lebedev, Vladimir Alexandrovich; Kholnova, Vera Ivanovna; Shesterikov, Stanislav Alexeevich; and Bobrovsky, Vasily Mikhailovich, 4,049,474, Cl. 148-32.500.

Kicherer, Robert: *See*—
Fischer, Karl; and Kicherer, Robert, 4,050,044, Cl. 337-137.000.

Kidwell, Louis E., Jr., to Pennzoil Company. Hydrogenated waxy olefin and process of making same. 4,049,893, Cl. 526-26.000.

Kieserling & Albrecht: *See*—
Lorenz, Horst, 4,048,833, Cl. 72-290.000.

Kikkoman Shoyu Co., Ltd.: *See*—
Ono, Fumio; and Aoyama, Yasuo, 4,049,831, Cl. 426-72.000.

Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Kato, Katsunori, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic material. 4,049,455, Cl. 96-76.00R.

Kikuchi, Yukio: *See*—
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.

Kikumoto, Ryoji: *See*—
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,049,645, Cl. 260-239.00B.

Kimberly-Clark Corporation: *See*—
Sigl, Wayne C.; and Lassen, Frederick O., 4,049,764, Cl. 264-178.00F.

Kindersley, Peter G., to Kamyr Incorporated. Diverter valve. 4,049,105, Cl. 193-31.00R.

King. Mendel; and Brannan, Raymond. Visible markers for road surfaces. 4,049,358, Cl. 404-11.000.

King-Seeley Thermos Co.: *See*—
Kohl, Vance L., 4,049,161, Cl. 222-233.000.

Kirby, Charles Ray: *See*—
Swinkels, Godefridus Maria; Furber, Robert Arthur; Milner, Edward Francis Godfrey; Genik-Sas-Berezowsky, Roman Michael; and Kirby, Charles Ray, 4,049,770, Cl. 423-37.000.

Kirknes, Bjorn: *See*—
Ramberg, Kjell Oystein; and Kirknes, Bjorn, 4,048,850, Cl. 73-133.00R.

Kirsch, Harry: *See*—
Berger, Helmut; Holzermer, Gunther; Kirsch, Harry; and Vijlbrief, Pieter, 4,049,967, Cl. 250-445.00T.

Kishi, Hajimu; and Takahashi, Masashi, to Oki Electric Industry Co., Ltd. Edit circuit for a numerical control system. 4,050,001, Cl. 318-625.000.

Kishi, Yoshio, to Sony Corporation. Cassette tape recording and/or reproducing apparatus. 4,050,087, Cl. 360-96.000.

Kishida, Katsuhiro: *See*—
Togawa, Kimmochi; Takao, Hiroshi; Matoba, Kazuo; and Kishida, Katsuhiro, 4,049,524, Cl. 204-195.00S.

Kishino, Takao; and Utamura, Yukihiko, to Futaba Denshi Kogyo K. K. Multi-digit fluorescent display tube with inclined filament cathode. 4,049,993, Cl. 313-497.000.

Kiss, Kornel Dezso: *See*—
Scardiglia, Frank; and Kiss, Kornel Dezso, 4,049,751, Cl. 260-876.00R.

Kissel, William Ronald, to Chrysler Corporation. Fuel metering apparatus and method. 4,048,964, Cl. 123-32.0ED.

Kita, Yasuo; and Kou, Makoto, to Shimadzu Seisakusho Ltd. Hydraulic motor with a mechanical brake device. 4,049,098, Cl. 192-8.00R.

Kitagawa, Norihisa, to Texas Instruments Incorporated. Partitioning of MOS random access memory array. 4,050,061, Cl. 340-173.00R.

Kittle, Donald B.: *See*—
Hanneman, Rodney E.; Chrenko, Richard M.; and Kittle, Donald B., 4,049,186, Cl. 228-225.000.

Kjolberg, Sven Arne: *See*—
Mejdell, Glor Thorvald; and Kjolberg, Sven Arne, 4,049,773, Cl. 423-127.000.

Klaiber, Erich Manfred: *See*—
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,049,682, Cl. 260-410.000.

Klassen, Horst Willi: *See*—
Heinz, Kurt Erich; and Klassen, Horst Willi, 4,049,087, Cl. 188-73.500.

Klein, Imrich: *See*—
Tadmor, Zehev; and Klein, Imrich, 4,049,245, Cl. 259-191.000.

Klein, Konrad: *See*—
Fabian, Wolfgang; Klein, Konrad; and Sevenich, Theodor, 4,048,831, Cl. 72-251.000.

Kleis, Gustav, to Geratewerk Lahr GmbH. Control devices for pick-up arms of record players. 4,049,279, Cl. 274-15.00R.

Kletschka, Harold D.; and Rafferty, Edson D., to Bio-Medicus, Inc. Fluid conveying surgical instrument. 4,049,002, Cl. 128-318.000.

Klocke, Donald J.: *See*—
Dwyer, Francis G.; and Klocke, Donald J., 4,049,737, Cl. 260-671.00P.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Hulsebusch, Karl-Heinz, 4,048,870, Cl. 74-473.00R.
Weigel, Horst; and Spitz, Anton, deceased, 4,049,445, Cl. 75-82.000.

Klockner-Werke AG: *See*—
Nagels, Gunther, 4,049,502, Cl. 203-10.000.

Kloften & Kloften A/S: *See*—
Ege, Sigmund, 4,048,686, Cl. 9-8.00R.

Klopfer, Howard J.: *See*—
Corn, John E., Jr.; and Klopfer, Howard J., 4,049,721, Cl. 260-619.00A.

Knabel, Korst. Apparatus for producing an instantaneous pressure on a workpiece. 4,048,840, Cl. 72-437.000.

Knahl, Herbert: *See*—
Freissmuth, Alfred; Heinl, Walter; Knahl, Herbert; and Pfluger, Erich, 4,049,442, Cl. 75-55.000.

Knauber, Veronica A.: *See*—
Sullivan, John L.; Knauber, Veronica A.; and Nelson, James E., 4,049,164, Cl. 224-5.00W.

Knollman, Dieter John Henry, to Bell Telephone Laboratories, Incorporated. Analog signal summing conference circuit. 4,049,920, Cl. 179-18.0BC.

Knorpp, Eberhard; and Schaffer, Silvian, to Siemens Aktiengesellschaft. Method and apparatus for digital data transmission. 4,049,908, Cl. 178-58.00R.

Knowles, C. Harry; Meckley, John R.; and Naylor, Charles A., to Metrologic Instruments, Inc. Laser beam alignment. 4,050,037, Cl. 331-94.50D.

Ko, Keiun; Takashina, Naomitsu; Shiokawa, Shigeru; and Fujita, Rokuro, to Mitsubishi Gas Chemical Company, Inc. In-air curable resin compositions. 4,049,634, Cl. 260-75.0UA.

Kobashi, Toshiyuki; Ozaki, Masahiko; Ono, Kenichi; and Abe, Noboru, to Japan Exlan Company Limited. Process for the polymerization of acrylonitrile. 4,049,605, Cl. 260-29.6AN.

Kobayashi, Nobuyuki: *See*—
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,049,538, Cl. 208-50.000.

Kobayashi, Toshio: *See*—
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.

Kobel, Erich, to Merck Patent Gesellschaft mit beschrankter Haftung. Two-chamber mixing syringe. 4,048,999, Cl. 128-272.100.

Kobler, Robert James, to AMP Incorporated. Circuit film strip and manufacturing method. 4,049,903, Cl. 174-68.500.

Koch, Terry David, to Inno-Cept Corporation. Insertion of compressible sheets in concrete. 4,049,359, Cl. 404-89.000.

Koenuma, Masao; and Gibu, Yoshitaka, to Asahi Seimitsu Kabu Shiki Kaisha. Feed index device in universal parallel ruler or the like. 4,048,725, Cl. 33-81.000.

Kohl, Vance L., to King-Seeley Thermos Co. Ice making and vending machine. 4,049,161, Cl. 222-233.000.

Kohler, Johann: *See*—
Rothe, Rudolf; and Kohler, Johann, 4,049,409, Cl. 62-9.000.

Koitabashi, Takeo; and Akamatsu, Hideo, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color photographic material. 4,049,456, Cl. 96-84.00R.

Kolb, Gustav: *See*—
Bardenheuer, Friedrich; and Kolb, Gustav, 4,048,857, Cl. 73-354.000.

Kolenik, Steve A.: *See*—
Walters, Robert A.; and Kolenik, Steve A., 4,049,003, Cl. 128-419.0PG.

Kollar, Ernest P., to International Business Machines Corporation. Helical scan magnetic recording device having a folded mounting plate. 4,050,090, Cl. 360-130.000.

Kollonitsch, Janos; and Marburg, Stephen, to Merck & Co., Inc. Fluorodesulfurization of alkyl mercaptans or alkyl dithianes. 4,049,708, Cl. 260-534.00C.

Kollwig, Horst: *See*—
Bach, Josef; Kollwig, Horst; Meitzner, Wolfgang; Weintritt, Horst; and Ueberdiek, Ralf, 4,049,209, Cl. 242-18.0PW.
Kolomoets, Nikolai Vasilievich; Dashevsky, Zinovy Moiseevich; Granovsky, Vladimir Isaakovich; Shmidt, Igor Aronovich; and Gelfgat, David Mendelevich. Film thermoelement. 4,049,469, Cl. 136-225.000.
Kolosov, Ivan Alexandrovich. Automatic device for maintaining the level of a stack of plates. 4,049,329, Cl. 312-71.000.
Kondo, Shinichi: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,049,497, Cl. 195-80.00R.
Konig, Fritz, to Losenhausen Maschinenbau AG. Method of determining standard sound levels. 4,048,860, Cl. 73-556.000.
Konig, Justus; Rohrig, Josef; and Hilliges, Friedrich, to Siemens Aktiengesellschaft. Switching arrangement for telecommunication switching systems. 4,049,922, Cl. 179-18.0AB.
Konig, Rolf; Nordemann, Bernhard; and Motek, Herbert, to Hazemag Dr. E. Andreas Kg. Comminuting machine for trash. 4,049,206, Cl. 241-73.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Kato, Katsunori, 4,049,455, Cl. 96-76.00R.
Koitabashi, Takeo; and Akamatsu, Hideo, 4,049,456, Cl. 96-84.00R.
Kontak Manufacturing Company Limited: *See*—
Singleton, Anthony, 4,049,235, Cl. 251-297.000.
Koontz, Donald Eldridge, to Bell Telephone Laboratories, Incorporated. Technique for stabilizing contact resistance of gold plated electrical contacts. 4,049,471, Cl. 148-13.000.
Koopman, Richard. Fishing reel drive mechanism. 4,049,217, Cl. 242-213.000.
Koppers Company, Inc.: *See*—
Lindgren, Carl G., 4,049,501, Cl. 202-239.000.
Korbuly, Jozsef: *See*—
Bole, Karoly; Nagy, Kalman; Aufsatz, Istvan; Bohnert, Jozsef; Branyi, Laszlo; Ilyes, Zoltan; Korbuly, Jozsef; and Nemeth, Janos, 4,048,803, Cl. 61-45.00D.
Korenko, Michael K.: *See*—
Hagel, William C.; Smidt, Frederick A.; and Korenko, Michael K., 4,049,431, Cl. 75-126.00C.
Hagel, William C.; Smidt, Frederick A.; and Korenko, Michael K., 4,049,432, Cl. 75-128.00F.
Korfund Dynamics Corporation: *See*—
Baratoff, Paul, 4,048,842, Cl. 72-455.000.
Korner, Anneliese F.; Piziali, Robert L.; and Ellsworth, Orval T., to Leland Stanford Junior University, The Board of Trustees of. Infant waterbed. 4,048,684, Cl. 5-370.000.
Korte, Klaus: *See*—
Groebke, Wolfgang; and Korte, Klaus, 4,049,642, Cl. 260-196.000.
Kortenski, Hristo Georgiev: *See*—
Nikolov, Ivan Dimov; Kortenski, Hristo Georgiev; Dimitrov, Dimiter Tanev; and Antonov, Asparuh Mihaylov, 4,049,041, Cl. 164-120.000.
Koshkin, Lev Nikolaevich: *See*—
Grinberg, Ijun Iosifovich; Zhukov, Evgeny Kuzmich; and Koshkin, Lev Nikolaevich, 4,049,389, Cl. 29-157.10R.
Kou, Makoto: *See*—
Kita, Yasuo; and Kou, Makoto, 4,049,098, Cl. 192-8.00R.
Kovach, Stephen M.; and Wilson, George D., to Ashland Oil, Inc. Platinum-palladium catalyst for selective hydrogenation of aromatics and olefins in hydrocarbon fractions. 4,049,576, Cl. 252-441.000.
Kovacsovics, Erzsebet: *See*—
Schawartz, Jozsef; Hornyak, Maria; Majorszki, Eva; David, Agoston; and Horvath, Gabor, 4,049,639, Cl. 260-140.000.
Kracklauer, John J., to Syntex (U.S.A.) Inc. Polyvinyl chloride composition containing ferrocene smoke suppressant additives. 4,049,618, Cl. 260-45.75P.
Kraft, Inc.: *See*—
Krueger, Grant Edward; and Leitner, Richard John, 4,049,838, Cl. 426-478.000.
Kraft, Paul: *See*—
Jin, Jung Il; and Kraft, Paul, 4,049,747, Cl. 260-859.0PV.
Kramer, Hyman. Blending and kneading apparatus. 4,049,243, Cl. 259-122.000.
Kraus, Wayne P.; and Hutson, Thomas, Jr., to Phillips Petroleum Company. Hydrofluorination process. 4,049,728, Cl. 260-653.600.
Krautkramer-Branson, Incorporated: *See*—
DiLeo, Christopher C., 4,050,055, Cl. 340-1.00R.
Kray, Raymond J., to Ciba-Geigy Corporation. N-cyanosulfonamides. 4,049,711, Cl. 260-551.00C.
Krebs, Daniel Fritz; and Miranda, Hector, to Union Carbide Corporation. Blood washing method using a saline wash solution of varying concentration for use with blood washing apparatus. 4,049,192, Cl. 233-14.00R.
Krekeler, Jerome H.: *See*—
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,049,896, Cl. 526-129.000.
Kremer, Charles J.: *See*—
Russell, Donald H.; and Kremer, Charles J., 4,049,007, Cl. 132-7.000.
Kreuz, Alois, to VDO Adolf Schindling AG. Rotational speed to impulse frequency converter. 4,049,986, Cl. 310-68.00B.
Krings, Josef. Sheeting-plate for trench sheeting. 4,048,778, Cl. 52-615.000.
Kronenberg, Marvin Lee, to Union Carbide Corporation. Non-aqueous cell having as cathode a mixture of lead dioxide and lead monoxide and/or lead particles. 4,049,892, Cl. 429-194.000.
Krueger, Grant Edward; and Leitner, Richard John, to Kraft, Inc. Manufacture of large cheese blocks. 4,049,838, Cl. 426-478.000.
Krueger, James Elwood: *See*—
Haeger, Bruce Edwin; Krueger, James Elwood; Lowery, James Alfred; and Ritter, Lawrence, 4,049,809, Cl. 424-250.000.
Kruithof, Albert: *See*—
Pettipher, Rodney; Viellevoye, Lucien Nicolas Leon; and Kruithof, Albert, 4,050,095, Cl. 364-200.000.
Krumbein, Fritz, to Robert Bosch GmbH. Film wind-up arrangement for motion-picture cameras. 4,049,340, Cl. 352-166.000.
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Isayama, Takuro; and Kubo, Kikuo, 4,050,078, Cl. 346-140.00R.
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Kera, Kazuo; Kubo, Yutaka; and Ihara, Hirokazu, 4,049,957, Cl. 235-153.0AK.
Kubus, James Michael; Seese, Ray Bruce; and Watson, Bela Lee, to Union Carbide Corporation. System for metering abrasive materials. 4,048,757, Cl. 51-436.000.
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Manabe, Toshikatsu; Ohta, Masao; Kudo, Tetsuichi; Mochizuki, Shouji; and Gejyo, Tetsuo, 4,049,789, Cl. 423-593.000.
Kuehnle, Manfred R., to Coulter Information Systems, Inc. Photoelectric measuring device. 4,049,963, Cl. 250-211.00R.
Kuipers, Marcus: *See*—
Gerritsen, Dirk J.; and Kuipers, Marcus, 4,049,263, Cl. 272-66.000.
Kunstmann, Rudolf; and Kaiser, Joachim, to Hoechst Aktiengesellschaft. 1,4-Dihydro-2H-isoquinoline derivatives. 4,049,655, Cl. 424-248.500.
Kunz, Bernard P. Apparatus for producing honeycomb paneling. 4,049,487, Cl. 156-436.000.
Kuo, James C.; Prater, Charles D.; and Wise, John J., to Mobil Oil Corporation. Method for upgrading Fischer-Tropsch synthesis products. 4,049,741, Cl. 260-676.00R.
Kuo, James C.: *See*—
Garwood, William E.; Jacob, Solomon M.; Kuo, James C.; and Wise, John J., 4,049,734, Cl. 260-668.00R.
Kuraishi, Tatsuo: *See*—
Gocho, Makio; Ota, Masanori; and Kuraishi, Tatsuo, 4,048,849, Cl. 73-105.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Yoshikawa, Shinsuke; Sasaki, Tohru; and Terasaki, Syuuzi, 4,049,859, Cl. 428-172.000.
Kurmeier, Hans-Adolf: *See*—
Schacht, Erich; Mehrhof, Werner; Wild, Albrecht; Gante, Joachim; and Kurmeier, Hans-Adolf, 4,049,823, Cl. 424-308.000.
Kuroda, Masao: *See*—
Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, 4,049,495, Cl. 195-36.00R.
Kussel, Willy: *See*—
Weirich, Walter; and Kussel, Willy, 4,048,866, Cl. 74-242.1FP.
Kutschke, C. T., to Nipak, Inc. Method and apparatus for forming a joint in a confined space between two abutting ends of conduit liners. 4,049,480, Cl. 156-94.000.
Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, to Takeda Chemical Industries, Ltd. Benzodiazepine carboxamides and pharmaceutical compositions with central nervous system activity. 4,049,812, Cl. 424-263.000.
L G Industries, Incorporated: *See*—
Davis, William F., 4,049,100, Cl. 192-58.00C.
Laber, Georg; and Schutze, Eberhard, to Sandoz Ltd. Synergistic compositions. 4,049,817, Cl. 424-270.000.
Laborit, Henri, to Centre d'Etudes Experimentales et Cliniques de Physio Biologie de Pharmacologie et d'Eutonologie. Treatment of hemorrhagic shock. 4,049,795, Cl. 424-180.000.
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Pasbrig, Max, 4,049,115, Cl. 206-.840.
Lacroix, Guy-Bernard: *See*—
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.
Ladany, Ivan, to RCA Corporation. Light emitting diode having a short transient response time. 4,049,994, Cl. 313-499.000.
Ladd Research Industries, Inc.: *See*—
Porter, John H., 4,049,242, Cl. 259-72.000.
Lade, Robert W.: *See*—
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,050,083, Cl. 357-28.000.
Lafon, Louis, to Societe anonyme dite: Laboratoire L. Lafon. Sulphur containing hydroxy aliphatic compounds. 4,049,829, Cl. 424-337.000.
LaFreniere, Larry Paul: *See*—
Motten, Roger Henwood, Jr.; and LaFreniere, Larry Paul, 4,050,045, Cl. 337-187.000.
Lagodka, Gunter: *See*—
Elsner, Burckhardt; Plevak, Lubomir; Lagodka, Gunter; and Rosenberg, Harry, 4,048,804, Cl. 61-45.00D.
Lahiri, Chitta Ranjan: *See*—
Bell, Richard; Sato, Takao; and Lahiri, Chitta Ranjan, 4,048,865, Cl. 74-231.00R.
Laing, Graham Stirling; and Ito, Shiro Tom, to Northern Electric Company Limited. Solenoid circuit for pushbutton release in telephones. 4,049,925, Cl. 179-99.000.

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Attwood, Alan; and Laithwaite, Eric Roberts, 4,049,983, Cl. 310-13.000.
Lam, Bing Lun; Lewis, Joseph James; Webb, Robert Lee; and Wellman, George Robert, to SmithKline Corporation. Process for preparing 5-(alkoxy- and aminoethyl thio)methylthiazole compounds. 4,049,669, Cl. 260-306.80R.
Lambert, Rudolph J., to Emerson Electric Co. Timer controlled space thermostat with battery operated timer. 4,049,973, Cl. 307-66.000.
Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., to Dow Chemical Company, The. Dehydration of α-methylbenzyl alcohols to form monovinylidene aromatic monomers. 4,049,736, Cl. 260-669.0QZ.
Landis, Phillip S.: *See*—
Nnadi, John C.; and Landis, Phillip S., 4,049,565, Cl. 252-51.50A.
Lane, Marvin K.; and Anderson, Winton C., to United States Gypsum Company. By-product gypsum fillers for mica-free joint compounds. 4,049,866, Cl. 428-402.000.
Langenbeck, Peter: *See*—
Ehlscheid, Gunter; Langenbeck, Peter; and Stemmler, Kurt, 4,049,945, Cl. 219-121.0LM.
Lapinski, Richard, to Catuma Pty. Limited. Hand caster. 4,048,743, Cl. 43-17.500.
Laporte Industries Limited: *See*—
Neumann, Barbara Susan, 4,049,780, Cl. 423-331.000.
Lardon, Marcel; and Pulker, Hans, to Balzers Patent und Beteiligungs AG. Method and apparatus for determining the rate of flow of particles in a vacuum deposition device. 4,049,352, Cl. 356-73.000.
Lare, Donald W., to Champion International Corporation. Self-bonding synthetic wood pulp and paper-like films thereof and method for production of same. 4,049,492, Cl. 162-146.000.
Lare, Donald W., to Champion International Corporation. Self-bonding synthetic wood pulp and paper-like films thereof and method for production of same. 4,049,493, Cl. 162-157.00R.
Large, George B., to Stauffer Chemical Company. Acaricidal and lepidoptericidal active carbon-imidothioates. 4,049,826, Cl. 424-326.000.
Larkins, John S., Jr. Suction power-driven air turbine. 4,048,798, Cl. 60-407.000.
Larson, Curtis Lee: *See*—
Casey, James H.; Larson, Curtis Lee; and Brown, Robert Campbell, 4,049,854, Cl. 428-72.000.
Laser, Manfred: *See*—
Bohnenstingl, Josef; Laser, Manfred; Lossmann, Gunter; and Gebhard, Helmut, 4,049,385, Cl. 23-277.00R.
Lassen, Frederick O.: *See*—
Sigl, Wayne C.; and Lassen, Frederick O., 4,049,764, Cl. 264-178.00F.
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Bunge, Wilhelm; Last, Wolf-Dieter; Saitner, Rudolf; and Wolf, Karlheinz, 4,049,610, Cl. 260-31.20N.
Latsch, Reinhard: *See*—
Bianchi, Valerio; Latsch, Reinhard; and Schmidt, Peter, 4,048,965, Cl. 123-32.0EA.
Lauder, Alan, to Du Pont de Nemours, E. I., and Company. Metal oxide catalytic compositions having perovskite crystal structures and containing metals of the platinum group. 4,049,583, Cl. 252-466.0PT.
Laugesen, Ronald C.: *See*—
Shieu, Mark S. D.; Johnson, Robert B.; and Laugesen, Ronald C., 4,049,979, Cl. 307-270.000.
Laurent, Henry; Annen, Klaus; Wiechert, Rudolf; and Hofmeister, Helmut, to Schering Aktiengesellschaft. Novel pregnanoic acid derivatives. 4,049,804, Cl. 424-242.000.
Laurin, Bernard L.; Rotenberg, Don H.; and Crandon, Harry D., to American Optical Corporation. Abrasion-resistant optical element. 4,049,868, Cl. 428-412.000.
Laux, Leon E. Window box planter with tool-free quick set-up and hanging adjustment. 4,048,754, Cl. 47-68.000.
Lavallee, Francois A.; Le Grand, Donald G.; and Gaines, George L., Jr., to General Electric Company. Pyridine-containing indicator dye. 4,049,649, Cl. 542-400.000.
LaVasseur, Jon D. Fuel-saving fireplace screen unit. 4,048,979, Cl. 126-202.000.
Laven, Merrill L. Above-ground pool walls, panels therefor, and panel-manufacturing methods. 4,048,773, Cl. 52-169.700.
Law, Harold Bell, to RCA Corporation. Method for forming a color television picture tube screen. 4,049,451, Cl. 96-36.100.
Lawrence Brothers Inc.: *See*—
Newlon, Robert L., 4,049,934, Cl. 200-61.700.
Lawrence, James R., to Raymond Lee Organization, Inc., a part interest. Air relief mechanism. 4,048,756, Cl. 49-171.000.
Lawrence Peska Associates, Inc.: *See*—
Matherne, Charley F., 4,049,555, Cl. 210-409.000.
Lazennec, Yvon: *See*—
Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, 4,049,884, Cl. 429-104.000.
Leaman, Roger John: *See*—
Williams, John Lloyd; Leaman, Roger John; Moberly, Robert Valentine; Stagg, Geoffrey Brian Kenneth; and Wisdom, Graham John, 4,050,059, Cl. 364-200.000.
Leavens, Dwight E.: *See*—
Smith, Gary W.; Leavens, Dwight E.; and Sims, Louis Ray, 4,049,685, Cl. 260-412.500.
Lebedev, Vladimir Alexandrovich: *See*—
Zakharov, Evegny Dmitrievich; Shneider, Gennady Lvovich; Valkov, Viktor Dmitrievich; Kapitonov, Viktor Pavlovich; Miklyaev, Petr Grigorievich; Lebedev, Vladimir Alexandrovich; Kholnova, Vera Ivanovna; Shesterikov, Stanislav Alexeevich; and Bobrovsky, Vasily Mikhailovich, 4,049,474, Cl. 148-32.500.
Lechner, Manfred; Schirm, Volker; and Dettmann, Heinrich, to Messerschmitt-Bolkow-Blohm. Device for manufacturing rotationally symmetrical constructional parts. 4,048,826, Cl. 72-21.000.
Lecrone, Dale S. Band-type roll slicing machine. 4,048,883, Cl. 83-4.000.
Lecrone, Dale S. Adjustable roll slicing system. 4,049,171, Cl. 225-94.000.
Ledan, Antoine. Movie viewing eyeglasses. 4,049,339, Cl. 351-45.000.
Ledterman, Robert S. Overhead bike light. 4,049,959, Cl. 240-7.550.
Lee, Timothy Charles Philip; and Millns, William, to Gould Inc. Treatment of vulcanized rubber. 4,049,588, Cl. 260-2.300.
Leedham, Harry W. T., to Borg-Warner Corporation. Finned tube bundle heat exchanger. 4,049,048, Cl. 165-159.000.
Leedom, Marvin Allan, to RCA Corporation. Pickup cartridge. 4,049,280, Cl. 274-37.000.
Leeds & Northrup Company: *See*—
Mosley, Gerald; and Raber, Ervin T., 4,050,065, Cl. 340-347.0NT.
le Febve de Vivy, Dominique, to Sulzer Brothers Ltd. Output regulator for a thermal power-producing plant. 4,049,971, Cl. 290-40.00R.
LeFebvre, Albert W. Apparatus for sighting a projectile firing weapon. 4,048,726, Cl. 33-180.00R.
Legnos, Peter John. Seagoing composite barge-tug vessel. 4,048,941, Cl. 114-248.000.
Le Grand, Donald G.: *See*—
Lavallee, Francois A.; Le Grand, Donald G.; and Gaines, George L., Jr., 4,049,649, Cl. 542-400.000.
Lehnhart, Dieter, to Glyco-Metall-Werke Daelen & Loos GmbH. Collar sleeves and process and tool for the manufacture thereof. 4,048,703, Cl. 29-149.5DP.
Leigh Products, Inc.: *See*—
Imhoff, William B., 4,049,304, Cl. 292-333.000.
Leitner, Richard John: *See*—
Krueger, Grant Edward; and Leitner, Richard John, 4,049,838, Cl. 426-478.000.
Leland Stanford Junior University, The Board of Trustees of: *See*—
Korner, Anneliese F.; Piziali, Robert L.; and Ellsworth, Orval T., 4,048,684, Cl. 5-370.000.
Lemaire, Maurice: *See*—
Da Costa Vieira, David; Dufayet, Jean-Pierre; and Lemaire, Maurice, 4,049,954, Cl. 235-151.320.
Lemay, Richard A.: *See*—
Miu, Ming T.; Negi, Virendra S.; and Lemay, Richard A., 4,050,097, Cl. 364-200.000.
Lemper, Anthony L.: *See*—
Pawlak, Joseph A.; Lemper, Anthony L.; and Pattison, Victor A., 4,049,629, Cl. 260-47.00C.
Le Pape, Alain Yves, to Produits Chimiques Ugine Kuhlmann. Dyed copolyesters and method of making. 4,049,376, Cl. 8-162.00R.
Lepp, Cyrus A.; Mason, Robert D.; and Ramsey, William S., to Corning Glass Works. Microbial medium having fluorescent growth indicator. 4,049,499, Cl. 195-100.000.
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Moisan, Michel; Leprince, Philippe; Beaudry, Claude; and Bloyet, Emile, 4,049,940, Cl. 219-10.55R.
Lever Brothers Company: *See*—
Rek, Johannes Henricus Maria, 4,049,687, Cl. 260-428.000.
Ringers, Hendrik Johan; and Segers, Jacobus Cornelis, 4,049,686, Cl. 260-424.000.
Rubin, Fred Kurt, 4,049,467, Cl. 134-2.000.
Levi, Israel, to Northern Telecom Limited. Self-adjusting voice frequency repeater. 4,049,928, Cl. 179-170.00R.
Levi, Phillip M., Jr.: *See*—
Grill, Carl E.; and Levi, Phillip M., Jr., 4,049,236, Cl. 254-28.000.
Levitt, Barry N.: *See*—
Crocker, Thomas H.; Levitt, Barry N.; and Suprenant, Paul J., 4,050,062, Cl. 340-183.000.
Lewis, Joseph James: *See*—
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Leybold-Heraeus GmbH & Co. Kg: *See*—
Grof, Helmut Theodor; Schumann, Jochen; Wamser, Anton; Schumann, Rainer; and Thomas, Werner Friedrich, 4,049,039, Cl. 164-52.000.
Ligon, Thomas R., to Hewlett-Packard Company. Method for fabricating a self-aligned metal oxide field effect transistor. 4,049,477, Cl. 148-187.000.
Lillard, Richard E.; and Cope, William M., to H. K. Porter Company, Inc. Current conductor system. 4,049,092, Cl. 191-40.000.
Lin, Chinlon: *See*—
Chang, Tao-Yuan; and Lin, Chinlon, 4,050,033, Cl. 331-94.50G.
Lindemann, Hans-Joachim; and Wiest, Peter P. Insufflator. 4,048,992, Cl. 128-184.000.
Lindemann, Martin K., to Chas. S. Tanner Co. Foamed pigmented emulsions for the backcoating of loosely structured fabrics. 4,049,862, Cl. 428-253.000.
Lindgren, Carl G., to Koppers Company, Inc. Device for spotting within tolerance apparatus associated with the coke oven chambers of a battery. 4,049,501, Cl. 202-239.000.
Lindstrom, Olle Birger. Electrochemical battery. 4,049,878, Cl. 429-18.000.
Link, Helmut, to Index-Werke KG Hahn & Tessky. System for supplying hydraulic fluid to aggregates on spindles or the like. 4,048,880, Cl. 82-29.00R.

Linke, Gerhard: *See—*
Distler, Walter; Zink, Roderich; and Linke, Gerhard, 4,049,968, Cl. 250-445.00T.
Lipfert, Gerhard: *See—*
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Lipp, Xaver. Apparatus for forming a large diameter pipe. 4,048,827, Cl. 72-50.000.
Lithium Corporation of America: *See—*
Bach, Ricardo O.; and Morrison, Robert C., 4,049,732, Cl. 260-668.00B.
Little, Richard Frederick: *See—*
Scheitlin, George Edward; and Little, Richard Frederick, 4,049,388, Cl. 23-288.0FB.
Litton Systems, Inc.: *See—*
Coutant, Ralph W., 4,048,707, Cl. 29-509.000.
Lo, Liu Ying P. Self-inflating liquid container for keeping I.V. fluid or blood plasma. 4,048,994, Cl. 128-214.00F.
Lo, Vincent; Vos, Kenneth D.; and Suchla, Germane M., to S. C. Johnson & Son, Inc. Pressurized container-dispensers and filling method. 4,049,158, Cl. 222-95.000.
Lobeck, Walter G.: *See—*
Wu, Yao Hua; and Lobeck, Walter G., 4,049,714, Cl. 260-564.00R.
Lock, William E. Interrupted intermittent motion device. 4,048,868, Cl. 74-436.000.
Lock, William E.; and Churillo, Charles J. Extraction assembly. 4,048,900, Cl. 86-48.000.
Lockheed Aircraft Corporation: *See—*
Fountain, Claude Lloyd, 4,049,221, Cl. 244-118.00R.
Loder, Harry A.; and Mathna, Charles A., to Minnesota Mining and Manufacturing Company. Pressure sensitive hot-melt adhesive system. 4,049,483, Cl. 156-230.000.
Long, David M.; and Dent, Joseph B., Jr., to PPG Industries, Inc. Forming level air conditioning system. 4,049,411, Cl. 65-2.000.
Longo, John M.: *See—*
Horowitz, Harold S.; and Longo, John M., 4,049,790, Cl. 423-599.000.
Lorenz, Horst, to Kieserling & Albrecht. Gripping arrangement. 4,048,833, Cl. 72-290.000.
Lorge, Michel; and Houba, Roger, to Solvay & Cie. Process for the manufacture of oriented hollow articles made of thermoplastic material. 4,049,761, Cl. 264-89.000.
Losenhausen Maschinenbau AG: *See—*
Konig, Fritz, 4,048,860, Cl. 73-556.000.
Lossmann, Gunter: *See—*
Bohnenstingl, Josef; Laser, Manfred; Lossmann, Gunter; and Gebhard, Helmut, 4,049,385, Cl. 23-277.00R.
Lotosh, Valery Efimovich; and Steblyak, Vladimir Demyanovich. Method for obtaining a lump product. 4,049,435, Cl. 75-3.000.
Lott, Joseph C., to Grow Chemical Corporation. High solids polyesters capable of dissolving in an organic solvent. 4,049,599, Cl. 260-22.00M.
Louverdrape, Inc.: *See—*
Hyman, David L.; Cayton, Robert J.; and Rosenquist, Kurt E., 4,049,038, Cl. 160-166.00A.
Louw, Johan August; and Ghiselin, Robert Earle, to Textron Inc. Inertia welding indexing system. 4,049,182, Cl. 228-2.000.
Lovett, Jack R. Electrical shorting device. 4,049,933, Cl. 200-48.00R.
Lowery, James Alfred: *See—*
Haeger, Bruce Edwin; Krueger, James Elwood; Lowery, James Alfred; and Ritter, Lawrence, 4,049,809, Cl. 424-250.000.
Lowski, Dieter: *See—*
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Lozach, Guy, to Societe Chimique des Charbonnages. Method of manufacture of foamed thermo-plastic extruded shapes. 4,049,760, Cl. 264-51.000.
Lozier, Gerald Scott; and Branin, Phyllis Brown, to RCA Corporation. Method for preparing filter-coated phosphor particles. 4,049,845, Cl. 427-68.000.
Lucas, Gary M.: *See—*
Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., 4,049,844, Cl. 427-54.000.
Lucas Industries Limited: *See—*
Roberts, Thomas Ernest Edwin, 4,048,903, Cl. 91-6.500.
Lucas, Roger; and Auberger, Jacques, to Forgeal, Societe pour le Forgeage et l'Estampage des Alliages Legers. Process for manufacturing monobloc wheels by die stamping and rotary extrusion. 4,048,828, Cl. 72-83.000.
Luchko, Viktor Nikolaevich: *See—*
Axelrod, Iosif Maxovich; Alengoz, Anton Savvich; Luchko, Viktor Nikolaevich; Mukhin, Valentin Alexandrovich; Nikolenko, Ignat Leontievich; and Potapenko, Igor Alexandrovich, 4,048,693, Cl. 15-310.000.
Luddy, Francis E.; Hampson, James W.; and Herb, Samuel F., to United States of America, Agriculture. Physiochemically designed fat compositions from tallow. 4,049,839, Cl. 426-607.000.
Ludvigson, Birger. Method of eliminating and uneven stress distribution in an elongated reinforced member. 4,048,706, Cl. 29-452.000.
Luitwieler, Samuel H., Jr., to Beckman Instruments, Inc. Nuclear radiation measuring method and apparatus having blanking time inversely related to count rate. 4,049,966, Cl. 250-369.000.
Luling, Adalbert, to F. W. Luling KG, Firma. Locks for doors and the like. 4,048,822, Cl. 70-93.000.
Lundberg, George A., to E. J. Brooks Company. Locking receptacle for electric meter box or the like. 4,049,313, Cl. 292-307.00R.
Lunkwitz, Klaus: *See—*
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.
Lurssen, Klaus: *See—*
Timmler, Helmut; Draber, Wilfried; Buchel, Karl Heinz; and Lurssen, Klaus, 4,049,418, Cl. 71-76.000.
Luthje, Holger: *See—*
Convertini, Ursula; Dimigen, Heinz; and Luthje, Holger, 4,049,521, Cl. 204-192.00E.
Luthra, Vinod K., to Mobil Oil Corporation. Method for extending thermoplastic foams having smooth external skins. 4,049,768, Cl. 264-45.500.
Lutz, Michael. Mold for manufacturing an integrally molded ball and socket type hinge. 4,049,231, Cl. 249-64.000.
Lyakhovetsky, Lev Semenovich: *See—*
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.
Lyman, John L.: *See—*
Robinson, C. Paul; Rockwood, Stephen D.; Jensen, Reed J.; Lyman, John L.; and Aldridge, Jack P., III, 4,049,515, Cl. 204-157.10R.
Lynch, Richard F., to N L Industries, Inc. Squeeze casting apparatus and method. 4,049,040, Cl. 164-120.000.
Lyon, Boyce M.: *See—*
Eskridge, Brewster B.; Lyon, Boyce M.; and Boasson, Eduard H., 4,049,766, Cl. 264-210.00F.
Maaghul, John, to PPG Industries, Inc. Glass fibers containing a dual polyester resin size. 4,049,865, Cl. 428-391.000.
MacArthur, Glen. Mechanical separation of substances. 4,049,201, Cl. 241-5.000.
Macchine Tessili Circolari MATEC S.p.A.: *See—*
Bianchi, Massimo, 4,048,817, Cl. 66-57.000.
MacInnis, Martin B.: *See—*
Quatrini, L. Rita; and MacInnis, Martin B., 4,049,771, Cl. 423-49.000.
Mackert, Robert J.: *See—*
Storm, Donald P.; Sammarco, Peter; Fritz, Edward A.; and Mackert, Robert J., 4,049,207, Cl. 241-101.700.
Mackie, Thomas Barnet, to Thomas Salter Limited. Question and answer game. 4,049,265, Cl. 273-1.00R.
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Maddox, Harry L., to Western Electric Company, Incorporated. Magnetic field probe which measures switching current of magnetic element at moment the element switches as measure of external field. 4,050,013, Cl. 324-43.00R.
Maeda, Yuji: *See—*
Ito, Akihiko; Kaetsu, Isao; Okubo, Hiroshi; Kato, Masamichi; Hayashi, Koichiro; and Maeda, Yuji, 4,049,867, Cl. 428-412.000.
Maeno, Shizuo: *See—*
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Maezawa, Tokio: *See—*
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.
Maezono, Masakazu: *See—*
Hattori, Torao; and Maezono, Masakazu, 4,049,101, Cl. 192-87.190.
Magee, Philip S., to Chevron Research Company. Insecticidal O,S-dihydrocarbyl-N-haloacylphosphoroamidothioates and S,S-dihydrocarbyl-N-haloacylphosphoroamidodithioates. 4,049,679, Cl. 260-402.500.
Maginness, Brian K., to Biometrics Instrument Corporation. Dual phase input multiplier. 4,050,005, Cl. 363-59.000.
Magnusson, Alan B.; and White, Howard S., to Armstrong Cork Company. Chain extending polyurethanes with a large excess of water. 4,049,632, Cl. 260-75.0NE.
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Oosterwijk, Hendrik Harm Jannes; Wiersum, Ulfert Elle; Magre, Eduard Pieter; and van Dijk, Johannes Hendrinus, 4,049,726, Cl. 260-649.00R.
Maher, James C.: *See—*
Pfister, Gustav R.; and Maher, James C., 4,050,027, Cl. 330-5.000.
Maitland, David Steven, to Hewlett-Packard Company. IGFET threshold voltage compensator. 4,049,980, Cl. 307-304.000.
Majewska, Janina; Grams, Wiktor; Rybicki, Zbigniew; and Banasiak, Jozef, to Instytut Wlokien Chemicznych. Method for purifying waste air from sulphuric gases, particularly in the production of viscose fibres. 4,049,775, Cl. 423-224.000.
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Schawartz, Jozsef; Hornyak, Maria; Majorszki, Eva; David, Agoston; and Horvath, Gabor, 4,049,639, Cl. 260-140.000.
Makap Limited: *See—*
Treanor, Eugene Joseph, 4,049,152, Cl. 220-209.000.
Maki, Tatuya: *See—*
Tujimoto, Hiroaki; Maki, Tatuya; Suganuma, Sadao; and Sano, Taketora, 4,049,556, Cl. 252-3.000.
Mallek, Heinz; Jablonski, Werner; and Augustin, Friedhelm, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Plant for burning waste. 4,048,927, Cl. 110-8.00R.

Malmedie & Co. Maschinenfabrik: *See*—
Faymonville, Ernst, 4,048,838, Cl. 72-405.000.
Maltese, Mario: *See*—
Schlaff, Norman; and Maltese, Mario, 4,049,911, Cl. 179-1.00H.
Mameniskis, Walter A.: *See*—
Sheng, Ming N.; and Mameniskis, Walter A., 4,049,724, Cl. 260-635.00H.
Manabe, Toshikatsu; Ohta, Masao; Kudo, Tetsuichi; Mochizuki, Shouji; and Gejyo, Tetsuo, to Hitachi, Ltd.; and Babcock-Hitachi K.K. Process for preparation of mixed oxide powders. 4,049,789, Cl. 423-593.000.
Mandel, George I. Toe clamp. 4,049,253, Cl. 269-137.000.
Manning, Harold E., to Petro-Tex Chemical Corporation. Dehydrogenation catalyst. 4,049,579, Cl. 252-455.00R.
Manufacturers Brush Company, The: *See*—
Samuelson, Ivar J., 4,048,765, Cl. 51-328.000.
Mao, Chung-Ling; and O'Shea, Francis X., to Uniroyal, Inc. Thermally stable polyurethane elastomer useful in molding flexible automobile exterior body parts. 4,049,636, Cl. 260-77.5CR.
Maranell, Melvin C., to Sta-Tite Corporation. Insulator for electric fences. 4,049,905, Cl. 174-163.00F.
Marans, Nelson Samuel; and Pollack, Alan Ricky, to W. R. Grace & Co. Biodegradable hydrophilic foams and method. 4,049,592, Cl. 260-2.5AD.
Marathon Electric Manufacturing Corporation: *See*—
Motten, Roger Henwood, Jr.; and LaFreniere, Larry Paul, 4,050,045, Cl. 337-187.000.
Marburg, Stephen: *See*—
Kollonitsch, Janos; and Marburg, Stephen, 4,049,708, Cl. 260-534.00C.
Marchand, Florian. Apparatus for trimming the nails. 4,049,009, Cl. 132-76.400.
Marchioro, Ignazio, to Escher Wyss Limited. Deflection compensating roll. 4,048,701, Cl. 29-116.0AD.
Marcy, Raymond, to Thomson-CSF. Automatic guidance system for moving objects. 4,049,961, Cl. 250-202.000.
Maringer, Robert E., to GTE Laboratories Incorporated. Apparatus for continuous casting. 4,049,042, Cl. 164-278.000.
Marsh, Dana G., to Xerox Corporation. Method for forming an electrophotographic member. 4,049,449, Cl. 96-1.50R.
Marsh, Norman F.; and Kelly, Warren H., to Dickey-john Corporation. Volumetric moisture tester. 4,050,016, Cl. 324-61.00R.
Marsh, Paul G., to Black Clawson Fibreclaim, Inc. Process for refuse disposal and heat recovery therefrom. 4,049,391, Cl. 44-10.00R.
Marston Excelsior Limited: *See*—
Keen, John William, 4,049,047, Cl. 165-107.000.
Martan, Michael, to UOP Inc. Synthesis of diphenylmethane using phosphoric-sulfuric acid catalyst. 4,049,733, Cl. 260-668.00C.
Martin, Donald E., to Rexnord Inc. Synthetic flanged carrier roller. 4,049,308, Cl. 295-8.000.
Martin, Johannes Josef. Apparatus for discharging cinders from an incinerator. 4,048,928, Cl. 110-165.00R.
Martin, Thomas R., to Condes Corporation. Method and apparatus for denesting cartons. 4,048,915, Cl. 101-35.000.
Martin, Walter L., Jr.: *See*—
Dent, Joseph B., Jr.; Martin, Walter L., Jr.; and Bennett, Howard M., 4,049,412, Cl. 65-2.000.
Martino, Paul D.; and Barbre, Norris H., to Harsco Corporation. Method of forming a pipe coupling. 4,049,762, Cl. 264-94.000.
Maruzen Petrochemical Co. Ltd.: *See*—
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,049,538, Cl. 208-50.000.
Marvin Glass & Associates: *See*—
Breslow, Jeffrey D.; and Jaworski, Eugene, 4,049,272, Cl. 273-95.00R.
Marx, Alvin J. Brace apparatus. 4,048,991, Cl. 128-165.000.
Marx, Matthias: *See*—
Eisentraeger, Klaus; Immel, Guenther; Marx, Matthias; Reinhard, Hans; Spoor, Herbert; and Storck, Gerhard, 4,049,847, Cl. 427-207.00B.
Masae, Watanabe, to Yamaha Hatsudoki Kabushiki Kaisha. Shock absorbing strut assembly. 4,049,251, Cl. 267-64.00R.
Maschinenfabrik Augsburg-Nurnberg AG: *See*—
Seifert, Hans; Will, Kurt; and Zapf, Horst, 4,048,974, Cl. 123-191.00M.
Maschio, Joseph, to Master Machine & Manufacturing Co. Shrimp sheller. 4,048,696, Cl. 17-69.000.
Mason, Robert D.: *See*—
Lepp, Cyrus A.; Mason, Robert D.; and Ramsey, William S., 4,049,499, Cl. 195-100.000.
Massa, Frank, to Fred M. Dollorfano, Jr. and Donald P. Amassa, Trustees of The Stoneleigh Trust. Electroacoustic transducer design for eliminating phantom target errors in sound ranging systems. 4,050,056, Cl. 340-1.00R.
Massachusetts Institute of Technology: *See*—
Hong, Henry Y-P; and Goodenough, John B., 4,049,891, Cl. 429-193.000.
Masserant, Irvin F.: *See*—
Brilovich, Gregorio; and Masserant, Irvin F., 4,049,566, Cl. 252-62.540.
Master Machine & Manufacturing Co.: *See*—
Maschio, Joseph, 4,048,696, Cl. 17-69.000.
Mastermix Engineering Company Limited, The: *See*—
English, Robert William, 4,049,205, Cl. 241-67.000.
Masters, John Edward, to Celanese Polymer Specialties Company. Process for making powder coatings. 4,049,744, Cl. 260-837.00R.
Matherne, Charley F., to Lawrence Peska Associates, Inc. Reusable filter apparatus. 4,049,555, Cl. 210-409.000.
Mathna, Charles A.: *See*—
Loder, Harry A.; and Mathna, Charles A., 4,049,483, Cl. 156-230.000.
Matoba, Kazuo: *See*—
Togawa, Kimmochi; Takao, Hiroshi; Matoba, Kazuo; and Kishida, Katsuhiro, 4,049,524, Cl. 204-195.00S.
Matrix Engineering Limited: *See*—
Kent, Anthony John, 4,048,841, Cl. 72-450.000.
Matsuda, Hiyoshi: *See*—
Mineo, Masatoshi; Oka, Ken-ichiro; Nakagawa, Kiyoshi; Matsuda, Hiyoshi; Ohno, Shigeo; and Takagi, Yasuo, 4,049,763, Cl. 264-176.00F.
Matsuda, Nobuo: *See*—
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Matsushita Electric Company of America: *See*—
Nakanishi, Mutsuo; and Schmidt, Hans, 4,050,050, Cl. 338-190.000.
Schmidt, Hans, 4,048,949, Cl. 116-124.300.
Matsushita Electric Industrial Co., Ltd.: *See*—
Ueno, Akihiko, 4,049,938, Cl. 219-10.55R.
Mattson, Arne, to Paul Anderson Industrier AB. Apparatus for obtaining substantially equal steplength of each jack in a group of pressure fluid operated climbing jacks. 4,049,237, Cl. 254-106.000.
Maurer, James I., to Oxy Metal Industries Corporation. Extended-life electrode. 4,049,526, Cl. 204-195.00M.
Maurer, John H., to United States of America, Air Force. Duct pressure actuated nozzle. 4,049,198, Cl. 239-265.390.
MAXPETERS Gesellschaft fur Verfahrenstechnik mbH: *See*—
Stamer, Walter; and Eichinger, Frithjof, 4,049,247, Cl. 266-182.000.
Maxwell, Earl G. Nestable non-corrosive container for pressurized beverages and processes for manufacture and handling thereof. 4,049,122, Cl. 206-519.000.
May, Randall L. Adjustable pitch drum. 4,048,895, Cl. 84-411.00A.
Mayo, Henry C. Anchor with independent pairs of flukes. 4,048,946, Cl. 114-307.000.
Mayville Engineering Company, Inc.: *See*—
Bachhuber, Theodore J.; and Bachhuber, Philip C., 4,048,899, Cl. 86-39.000.
McCall, Adrian W.; and Kellogg, William L. Tethered ball and shaft game device. 4,049,270, Cl. 273-95.00A.
McClocklin, Samuel B., to Owatonna Tool Company. Rotary valve. 4,049,019, Cl. 137-625.210.
McDaniels, Louis Marion: *See*—
Church, John Allen; Feinstein, Paul, Jr.; Hunt, Ronald Eugene; McDaniels, Louis Marion; and Munch, Paul Francis, 4,049,256, Cl. 271-9.000.
McDermott, Clifton Eugene. Dual identification card and identification card holder. 4,048,737, Cl. 40-2.200.
McDonald, Walter; Seitel, Norbert F.; and Ayres, John E. Operator-actuated elevating device. 4,049,081, Cl. 182-148.000.
McEntire, Edward E.; and Speranza, George P., to Texaco Development Corporation. Foams and elastomers prepared in the presence of high tertiary amine content polyurethane catalysts. 4,049,591, Cl. 260-2.5AC.
McFadyen, Robert J.; and Peil, William, to General Electric Company. AM-FM receiver having improved mode conversion. 4,050,022, Cl. 325-315.000.
McFadyen, Robert J., to General Electric Company. Electronic apparatus comprising an audio amplifier providing shunt voltage regulation. 4,050,029, Cl. 330-22.000.
McFarland, Archie Rae, to Beehive Machinery Inc. Process for the separation of fat from animal skins. 4,049,684, Cl. 260-412.000.
McGaffin, Andrew W. Multi-use furniture. 4,049,314, Cl. 297-130.000.
McGhee, John D., to Du Pont de Nemours, E. I., and Company. Drive for dynamic mechanical system. 4,049,997, Cl. 318-128.000.
McHenry, Edward R. Display sign and replaceable message. 4,048,738, Cl. 40-16.000.
McIlveen, Edward E.: *See*—
Ellers, Fred S.; Hally, Hugh G.; McIlveen, Edward E.; and Doble, William A., 4,048,807, Cl. 61-105.000.
McKee Bros. Limited: *See*—
McKee, Russell C., 4,049,204, Cl. 241-55.000.
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McKenzie, Alexander J., III. Building structure. 4,048,770, Cl. 52-81.000.
McKenzie, Edwin Charles, to Babcock & Wilcox, Limited. Coal slurry drying apparatus. 4,049,203, Cl. 241-52.000.
McLoughlin, Bernard Joseph; and Guildford, Allen John, to Imperial Chemical Industries Limited. 2-Phenyl ethyl morpholine compounds. 4,049,808, Cl. 424-248.400.
McOnie, Malcolm Peter; Tucker, Anthony John Philip; and van Lienden, Peter Willem, to Imperial Chemical Industries Limited. Reactor and process for vinyl chloride polymerization. 4,049,895, Cl. 526-62.000.
Mead Corporation, The: *See*—
Wood, Prentice J., 4,049,189, Cl. 229-48.00R.
Mead Johnson & Company: *See*—
Wu, Yao Hua; and Lobeck, Walter G., 4,049,714, Cl. 260-564.00R.

Mead, Keith E.: *See—*
Hoover, William R.; Mead, Keith E.; and Street, Henry K., 4,049,864, Cl. 428-332.000.

Meckley, John R.: *See—*
Knowles, C. Harry; Meckley, John R.; and Naylor, Charles A., 4,050,037, Cl. 331-94.50D.

Medinger, Bernhard: *See—*
Elsener, Anton; Gehrt, Hans Harald; Medinger, Bernhard; and Wiese, Volkhard, 4,049,615, Cl. 260-39.00P.

Medlin, William K. Clamp apparatus. 4,049,166, Cl. 224-42.10G.

Meguro, Kanji: *See—*
Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, 4,049,812, Cl. 424-263.000.

Mehrhof, Werner: *See—*
Schacht, Erich; Mehrhof, Werner; Wild, Albrecht; Gante, Joachim; and Kurmeier, Hans-Adolf, 4,049,823, Cl. 424-308.000.

Meiller, Francois, to Rhone-Progil. Aromatic amino silanes and their polymers. 4,049,691, Cl. 260-448.20N.

Meindl, Hubert: *See—*
Hindermann, Peter; and Meindl, Hubert, 4,049,656, Cl. 260-256.50R.

Meitzner, Wolfgang: *See—*
Bach, Josef; Kollwig, Horst; Meitzner, Wolfgang; Weintritt, Horst; and Ueberdiek, Ralf, 4,049,209, Cl. 242-18.0PW.

Mejdell, Glor Thorvald; and Kjolberg, Sven Arne, to Norsk Hydro A.S. Process for precipitation of aluminum hydroxide from aluminate solution. 4,049,773, Cl. 423-127.000.

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Cotty, Val F.; Sterbenz, Francis J.; and Melman, Kenneth J., 4,049,803, Cl. 424-233.000.

Memorex Corporation: *See—*
Brilovich, Gregorio; and Masserant, Irvin F., 4,049,566, Cl. 252-62.540.

Menashi, Wilson P.: *See—*
Wenckus, Joseph F.; Menashi, Wilson P.; and Castonguay, Roger A., 4,049,384, Cl. 23-273.0SP.

Menear, Wallace C.: *See—*
Jaco, Charles M., Jr.; Menear, Wallace C.; and Clark, Donald W., 4,049,441, Cl. 75-35.000.

Menet, Albert: *See—*
Chabardes, Pierre; Julia, Marc; and Menet, Albert, 4,049,718, Cl. 260-590.00C.

Mercier, Serge: *See—*
Gueant, Auguste; and Mercier, Serge, 4,049,725, Cl. 260-638.00B.

Merck & Co., Inc.: *See—*
Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,049,559, Cl. 252-8.55D.
Kollonitsch, Janos; and Marburg, Stephen, 4,049,708, Cl. 260-534.00C.
Witzel, Bruce E.; Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,049,417, Cl. 71-67.000.

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Kobel, Erich, 4,048,999, Cl. 128-272.100.
Pohlke, Rolf, 4,049,659, Cl. 260-268.0TR.
Schacht, Erich; Mehrhof, Werner; Wild, Albrecht; Gante, Joachim; and Kurmeier, Hans-Adolf, 4,049,823, Cl. 424-308.000.

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O'Neill, James L., 4,049,190, Cl. 206-611.000.

Merrin, Seymour, to Innotech Corporation. Glass switching device using an ion impermeable glass active layer. 4,050,082, Cl. 357-2.000.

Messerschmitt-Bolkow-Blohm: *See—*
Lechner, Manfred; Schirm, Volker; and Dettmann, Heinrich, 4,048,826, Cl. 72-21.000.

Metal Box Limited: *See—*
Beveridge, John; Davies, Thomas Roderick Harries; Fidler, Fred; and Ring, Maurice Frank, 4,048,935, Cl. 113-120.00F.
Franek, Jozef Tadeusz; and Porucznik, Paul, 4,049,261, Cl. 271-269.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Bierbach, Herbert; Dittmar, Heinz; Heinz, Ernst; Hohmann, Klaus; and Rennhack, Rolf, 4,049,788, Cl. 423-592.000.
Wohler, Fritz; Stonner, Hans-Martin; and Wiesner, Paul, 4,049,782, Cl. 423-352.000.

Metcalfe, Kenneth A.; Wilson, Clive Westgarth; and Field, Denton. Energized liquid developers for developing electrostatic images. 4,049,446, Cl. 96-1.0LY.

Metrologic Instruments, Inc.: *See—*
Knowles, C. Harry; Meckley, John R.; and Naylor, Charles A., 4,050,037, Cl. 331-94.50D.

Metzger, Carl; Eue, Ludwig; and Hack, Helmuth, to Bayer Aktiengesellschaft. N-(2-Ethylsulfonyl-1,3,4-thiadiazol-5-yl)-N-methyl-N'-methylurea. 4,049,670, Cl. 260-306.80D.

Metzger, Julio, to E. R. Squibb & Sons, Inc. Amphotericin complexes containing oxalic acid and calcium. 4,049,898, Cl. 536-17.000.

Mey, H.: *See—*
Hafner, E.; and Mey, H., 4,049,906, Cl. 178-2.00C.

Meyer, Gustave, to Stumpf, Irvin L., a part interest. Hauling vehicle with side dump body. 4,049,137, Cl. 214-82.000.

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Meyers, Norman W., to Erco Industries Limited. Treatment of cell anodes. 4,049,513, Cl. 204-290.00F.

Michael Seidel, GmbH. & Co. KG, Firma: *See—*
Muller-Seidel, Karl-Heinz; and Muller-Seidel, Klaus, 4,048,751, Cl. 46-250.000.

Middelhoek, Servaas; Santing, Gerhardus; and Dost, Nicolaas, to Shell Oil Company. Process for the manufacture of aluminum. 4,049,425, Cl. 75-135.000.

Midrex Corporation: *See—*
Beggs, Donald, 4,049,440, Cl. 75-35.000.
Jaco, Charles M., Jr.; Menear, Wallace C.; and Clark, Donald W., 4,049,441, Cl. 75-35.000.

Mifsud, Joseph F., to Exxon Production Research Company. Seismic vibrator control system. 4,049,077, Cl. 181-114.000.

Mifuji Iron Works Co., Ltd.: *See—*
Ito, Shozo, 4,049,395, Cl. 48-197.00R.

Miklyaev, Petr Grigorievich: *See—*
Zakharov, Evegny Dmitrievich; Shneider, Gennady Lvovich; Valkov, Viktor Dmitrievich; Kapitonov, Viktor Pavlovich; Miklyaev, Petr Grigorievich; Lebedev, Vladimir Alexandrovich; Kholnova, Vera Ivanovna; Shesterikov, Stanislav Alexeevich; and Bobrovsky, Vasily Mikhailovich, 4,049,474, Cl. 148-32.500.

Milianowicz, Stanislaw A.: *See—*
Frink, Russell E.; and Milianowicz, Stanislaw A., 4,049,936, Cl. 200-146.00R.

Miller, Allan Sinclair. Gas compressors. 4,049,410, Cl. 62-197.000.

Miller, Franz-Friedrich: *See—*
Erdmann, Hans; and Miller, Franz-Friedrich, 4,049,379, Cl. 8-94.260.

Miller, Harold N.: *See—*
Ryer, Jack; Zielinski, James; Miller, Harold N.; and Brois, Stanley J., 4,049,564, Cl. 252-51.50A.

Milliken Research Corporation: *See—*
Cole, Leon J.; and Tolan, John R., 4,049,168, Cl. 226-40.000.

Millns, William: *See—*
Lee, Timothy Charles Philip; and Millns, William, 4,049,588, Cl. 260-2.300.

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Katona, Joseph W., 4,049,939, Cl. 219-10.55D.

Milmark Research, Inc.: *See—*
Pugliese, Peter T., 4,049,830, Cl. 424-343.000.

Milner, Edward Francis Godfrey: *See—*
Swinkels, Godefridus Maria; Furber, Robert Arthur; Milner, Edward Francis Godfrey; Genik-Sas-Berezowsky, Roman Michael; and Kirby, Charles Ray, 4,049,770, Cl. 423-37.000.

Mineo, Masatoshi; Oka, Ken-ichiro; Nakagawa, Kiyoshi; Matsuda, Hiyoshi; Ohno, Shigeo; and Takagi, Yasuo, to Toray Industries, Inc. Process for producing a highly oriented polyester undrawn yarn. 4,049,763, Cl. 264-176.00F.

Minnesota Mining and Manufacturing Company: *See—*
Casey, James H.; Larson, Curtis Lee; and Brown, Robert Campbell, 4,049,854, Cl. 428-72.000.
Loder, Harry A.; and Mathna, Charles A., 4,049,483, Cl. 156-230.000.
Nozari, Mohammad S., 4,049,861, Cl. 428-220.000.

Minniear, Carl E. Bracket device. 4,049,230, Cl. 248-539.000.

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Toriumi, Shiro; and Yamagishi, Seiichi, 4,049,341, Cl. 353-23.000.

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Krebs, Daniel Fritz; and Miranda, Hector, 4,049,192, Cl. 233-14.00R.

Missio, Danilo V., to SpectraMetrics, Incorporated. Spectrometric system and cassette. 4,049,353, Cl. 356-85.000.

Mitani, Kazumitsu: *See—*
Nakagawa, Tetsuo; Matsuda, Nobuo; Mitani, Kazumitsu; and Tanemoto, Toshiharu, 4,049,541, Cl. 208-127.000.

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Mitchell, Peter W., to Audio Pulse, Inc. Channel mixer for multi-channel audio systems. 4,049,912, Cl. 179-1.0GQ.

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Mitoff, Stephen Paul, to Electric Power Research Institute, Inc. Construction for solid electrolyte in sodium/sulfur battery. 4,049,885, Cl. 429-104.000.

Mitsubishi Chemical Industries Limited: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,049,645, Cl. 260-239.00B.
Shigematsu, Taichiro; Shibahara, Tetsuya; Nakazawa, Makoto; Tomida, Masayuki; and Munakata, Toshio, 4,049,820, Cl. 424-273.00P.

Mitsubishi Gas Chemical Company, Inc.: *See—*
Ko, Keiun; Takashina, Naomitsu; Shiokawa, Shigeru; and Fujita, Rokuro, 4,049,634, Cl. 260-75.0UA.

Mitsubishi Petrochemical Company Limited: *See—*
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Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Sato, Hiroshi; Okumura, Munehiro; Itani, Fujio; Fujii, Shouji; Kakuda, Tsutomu; and Nakatui, Hiroshi, 4,049,593, Cl. 260-2.50E.

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Morisaki, Shigeyoshi, 4,049,481, Cl. 156-151.000.

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Harimoto, Takeshi; and Nishiyama, Keisuke, 4,049,527, Cl. 204-198.000.

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Mosterd, Jacob Hendrik, 4,049,111, Cl. 198-445.000.

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Baron, Arthur L.; and Bailey, John V., 4,049,614, Cl. 260-37.0PC.

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Chen, Nai Yuen; and Reagan, William Joseph, 4,049,735, Cl. 260-668.00R.
Dwyer, Francis G.; and Klocke, Donald J., 4,049,737, Cl. 260-671.00P.
Florian, John, 4,049,187, Cl. 229-1.50B.
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Kaeding, Warren W., 4,049,573, Cl. 252-432.000.
Kuo, James C.; Prater, Charles D.; and Wise, John J., 4,049,741, Cl. 260-676.00R.
Luthra, Vinod K., 4,049,768, Cl. 264-45.500.
Nnadi, John C.; and Landis, Phillip S., 4,049,565, Cl. 252-51.50A.
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Yan, Tsoung Y.; Huang, Tracy J.; and Haag, Werner O., 4,049,539, Cl. 208-65.000.
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Manabe, Toshikatsu; Ohta, Masao; Kudo, Tetsuichi; Mochizuki, Shouji; and Gejyo, Tetsuo, 4,049,789, Cl. 423-593.000.

Moczygemba, George A., to Phillips Petroleum Company. Coupling of alkali metal-terminated polymers. 4,049,753, Cl. 260-880.00B.

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Mold, Donald F.; and Rice, Ronald G., to Owens-Illinois, Inc. Recuperator structures. 4,049,049, Cl. 165-165.000.

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Rakowicz, Jan Antoni; and Harrison, Brian, 4,048,950, Cl. 118-6.000.

Molloy, Bryan Barnet, to Eli Lilly and Company. Method of treating arrhythmia with diarylbutanolamines. 4,049,827, Cl. 424-330.000.

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Bussard, Charles B., 4,049,177, Cl. 227-67.000.
Hamisch, Paul H., Jr., 4,049,357, Cl. 403-209.000.
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Jenkins, William A., 4,049,176, Cl. 227-67.000.
Jenkins, William A., 4,049,179, Cl. 227-67.000.
Strausburg, Larry D., 4,049,178, Cl. 227-67.000.

Monsanto Company: *See*—
D'Amico, John J., 4,049,419, Cl. 71-76.000.
Hirzy, John William, 4,049,611, Cl. 260-31.600.

Montalvo, Edwin J., Sr. Multiple speed web rewind transmission in series with a slip coupling. 4,049,095, Cl. 192-3.510.

Montedison S.p.A.: *See*—
Bianchi, Sergio; Bornengo, Mario; and Frangioni, Alessandro, 4,049,755, Cl. 260-987.000.

Moog, Gerhard W.; and Cooper, Kenneth R., to Canada Square Management Limited. Heating and cooling system for buildings. 4,049,045, Cl. 165-12.000.

Mooi, John: *See*—
Erickson, Henry; and Mooi, John, 4,049,582, Cl. 252-466.0PT.

Moore, Richard Pierpoint. Liquid condition and settling tanks. 4,049,549, Cl. 210-104.000.

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Weaver, Max A.; Straley, James M.; and Moore, William H., 4,049,643, Cl. 260-207.100.

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Morehouse, Donald S., Jr.; and Bolton, Frank Harold, deceased (by Bolton, Kathryn M., administratrix), to Dow Chemical Company, The. Emulsion polymerization method for preparing aqueous dispersions of organic polymer particles. 4,049,604, Cl. 260-29.6RW.

Morel, Paul; and Dugois, Jean-Pierre, to Aluminum Pechiney. Method and a device for the supply of electric current to transverse igneous electrolysis tanks to minimize effects of magnetic fields. 4,049,528, Cl. 204-243.00M.

Morelli, Amedeo J.: *See*—
Francis, Gaylord L.; and Morelli, Amedeo J., 4,050,053, Cl. 338-332.000.

Morford, Marvin A. Rodent trap. 4,048,745, Cl. 43-69.000.

Morgan, Charles W.: *See*—
Goodale, Clark W.; Morgan, Charles W.; and Rhoton, Albert L., 4,049,848, Cl. 427-244.000.

Mori, Toshihiro; and Ando, Seigo, to Nippon Kokan Kabushiki Kaisha. Eddy current flaw detector using a pair of parallel resonant circuits and a negative resistance in parallel with each circuit. 4,050,011, Cl. 324-40.000.

Morii, Akimitsu: *See*—
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Morris, Monica F.: *See*—
Freeman, George M.; Dulson, John E.; and Morris, Monica F., 4,049,514, Cl. 204-119.000.

Morrison, Robert C.: *See*—
Bach, Ricardo O.; and Morrison, Robert C., 4,049,732, Cl. 260-668.00B.

Morrissey, Ronald J., to Technic, Inc. Tin-nickel plating. 4,049,508, Cl. 204-43.00S.

Morse, Donald B.; and Pribish, Bernard A., to Kemlite Corporation. Machine for trimming the edges of panels. 4,048,887, Cl. 83-79.000.

Mortell Company: *See*—
Patel, Kanti D., 4,049,600, Cl. 260-22.0EP.

Mortl, Gunther Lorenz; Werthmann, Eckhart; and Zoglmeyr, Gunther, to Osterreichisch-Amerkianische Magnesit Aktiengesellschaft. Unfired, refractory, basic bricks and compositions and their method of manufacture. 4,049,461, Cl. 106-56.000.

Morton-Norwich Products, Inc.: *See*—
Orelup, Richard B., 4,049,393, Cl. 44-59.000.
White, Ralph L., Jr., 4,049,650, Cl. 542-400.000.

Moser, Peter; Eysn, Manfred; Enkner, Bernhard; Berger, Rupert; Wagner, Wolfgang; and Spannlang, Ronald, to Vereinigte Osterreichische Eisen - und Stahlwerke - Alpine Montan Aktiengesellschaft. Tiltable converter. 4,049,249, Cl. 266-247.000.

Mosevang, Orla: *See*—
Udengaard, Poul Werner; Mosevang, Orla; Thomsen, Finn Erling; and Eklund, Erik Paul, 4,049,403, Cl. 55-378.000.

Mosley, Gerald; and Raber, Ervin T., to Leeds & Northrup Company. Dual slope analog to digital converter with delay compensation. 4,050,065, Cl. 340-347.0NT.

Moss, Philip H.: *See*—
Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., 4,049,657, Cl. 260-268.0SY.

Mosterd, Jacob Hendrik, to Moba Holding Barneveld B.V. Device for conveying eggs. 4,049,111, Cl. 198-445.000.

Motek, Herbert: *See*—
Konig, Rolf; Nordemann, Bernhard; and Motek, Herbert, 4,049,206, Cl. 241-73.000.

Motorola, Inc.: *See*—
Bennett, Thomas H.; and Wiles, Michael F., 4,050,096, Cl. 364-200.000.
Houf, Robert Henry, Jr., 4,049,169, Cl. 226-47.000.
Zobel, Don W., 4,049,326, Cl. 303-92.000.

Motsinger, Donald L., to PPG Industries, Inc. Glass fiber sizing composition. 4,049,597, Cl. 260-18.0EP.

Motten, Roger Henwood, Jr.; and LaFreniere, Larry Paul, to Marathon Electric Manufacturing Corporation. Finned heat sink for fuse blocks. 4,050,045, Cl. 337-187.000.

MPL, Inc.: *See*—
Raghavachari, Srinivas T.; and Striebel, Robert L., II, 4,048,997, Cl. 128-215.000.

Mukhin, Valentin Alexandrovich: *See*—
Axelrod, Iosif Maxovich; Alengoz, Anton Savvich; Luchko, Viktor Nikolaevich; Mukhin, Valentin Alexandrovich; Nikolenko, Ignat Leontievich; and Potapenko, Igor Alexandrovich, 4,048,693, Cl. 15-310.000.

Muller-Seidel, Karl-Heinz; and Muller-Seidel, Klaus, to Michael Seidel,

GmbH. & Co. KG, Firma. Remotely steered toy boat. 4,048,751, Cl. 46-250.000.
Muller-Seidel, Klaus: *See*—
Muller-Seidel, Karl-Heinz; and Muller-Seidel, Klaus, 4,048,751, Cl. 46-250.000.
Munakata, Toshio: *See*—
Shigematsu, Taichiro; Shibahara, Tetsuya; Nakazawa, Makoto; Tomida, Masayuki; and Munakata, Toshio, 4,049,820, Cl. 424-273.00P.
Munch, Paul Francis: *See*—
Church, John Allen; Feinstein, Paul, Jr.; Hunt, Ronald Eugene; McDaniels, Louis Marion; and Munch, Paul Francis, 4,049,256, Cl. 271-9.000.
Murat, Roger, to Societe d'Applications Generales d'Electricite et de Mecanique SAGEM. Printing devices or heads for printers or the like and a process for making such a printing head. 4,049,107, Cl. 197-1.00R.
Murata Manufacturing Co., Ltd.: *See*—
Honda, Fumio; Taki, Tsuneo; and Kajiwara, Masatoshi, 4,049,118, Cl. 206-330.000.
Murphy, Alan P., to Procter & Gamble Company, The. Article for softening fabrics in an automatic clothes dryer. 4,049,858, Cl. 428-136.000.
Murphy, Milo E., to Murphy Muffler, Inc. Sound damping apparatus. 4,049,075, Cl. 181-220.000.
Murphy, Milo E., to Murphy Muffler, Inc. Sound damping apparatus. 4,049,076, Cl. 181-224.000.
Murphy Muffler, Inc.: *See*—
Murphy, Milo E., 4,049,075, Cl. 181-220.000.
Murphy, Milo E., 4,049,076, Cl. 181-224.000.
Murphy, William J.: *See*—
Berg, Robert L.; Murphy, William J.; and Simmons, Dennis E., Jr., 4,050,068, Cl. 343-6.00R.
Murray, Norman R.: *See*—
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Musolf, Thomas Carl: *See*—
Dutton, Daniel Ronan; and Musolf, Thomas Carl, 4,049,525, Cl. 204-195.00C.
Muzyczko, Thaddeus M.; Frederiksen, Ronald A.; and York, David L., to Richardson Company, The. Intermediate coating compositions and long running planographic plates prepared therewith. 4,049,746, Cl. 260-851.000.
Myers, Lewis P., to Carpenter Technology Corporation. Precipitation hardenable stainless steel. 4,049,430, Cl. 75-124.000.
Myerson, Elliot Lee; and Gillis, Richard W. Capo tasto. 4,048,894, Cl. 84-318.000.
N L Industries, Inc.: *See*—
Lynch, Richard F., 4,049,040, Cl. 164-120.000.
N. V. Tramposafe: *See*—
Gerritsen, Dirk J.; and Kuipers, Marcus, 4,049,263, Cl. 272-66.000.
Naarmann, Herbert: *See*—
Fleig, Helmut; Hagen, Helmut; Naarmann, Herbert; and Penzien, Klaus, 4,049,622, Cl. 260-2.5HB.
Nadelson, Jeffrey, to Sandoz, Inc. Substituted isoxazolo pyridinones. 4,049,813, Cl. 424-263.000.
Naganawa, Hiroshi: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,049,497, Cl. 195-80.00R.
Nagano, Michio: *See*—
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Nagaoka, Isao: *See*—
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Nagase, Hiroshi: *See*—
Aoyama, Tsuyoshi; Hayashi, Yoshimasa; Nagano, Michio; and Nagase, Hiroshi, 4,049,874, Cl. 428-451.000.
Nagashima, Toshio: *See*—
Nakaguchi, Michiharu; and Nagashima, Toshio, 4,048,958, Cl. 118-658.000.
Nagels, Gunther, to Klockner-Werke AG. Method of and apparatus for distilling of liquids. 4,049,502, Cl. 203-10.000.
Nagy, Kalman: *See*—
Bole, Karoly; Nagy, Kalman; Aufsatz, Istvan; Bohnert, Jozsef; Branyi, Laszlo; Ilyes, Zoltan; Korbuly, Jozsef; and Nemeth, Janos, 4,048,803, Cl. 61-45.00D.
Nakagawa, Kiyoshi: *See*—
Mineo, Masatoshi; Oka, Ken-ichiro; Nakagawa, Kiyoshi; Matsuda, Hiyoshi; Ohno, Shigeo; and Takagi, Yasuo, 4,049,763, Cl. 264-176.00F.
Nakagawa, Tetsuo; Matsuda, Nobuo; Mitani, Kazumitsu; and Tanemoto, Toshiharu, to Chiyoda Chemical Engineering & Construction Co. Ltd.; and Mitsubishi Petrochemical Company Limited. Process for controlling the size of coke particles within a fluidized bed. 4,049,541, Cl. 208-127.000.
Nakaguchi, Michiharu; and Nagashima, Toshio, to Fuji Xerox Co., Ltd. Magnetic brush developing device. 4,048,958, Cl. 118-658.000.
Nakai, Shiro; and Nishikawa, Yoshio, to Glory Kogyo Kabushiki Kaisha. Coin stacking device. 4,049,011, Cl. 133-1.00A.
Nakamoto, Keiji: *See*—
Hori, Yutaka; Honda, Zenzo; Suzuki, Kenji; Nakamoto, Keiji; and Yamamoto, Yoshiharu, 4,049,904, Cl. 174-107.000.
Nakamura, Kunio; and Takahashi, Mitsuo, to Nippon Steel Corporation. Method producing slag ballast. 4,049,439, Cl. 75-24.000.
Nakamura, Norihiko: *See*—
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Nakamura, Yoshimi: *See*—
Sasaki, Yutaka; Morii, Akimitsu; Nakamura, Yoshimi; Moriya, Kiyoshi; and Utsumi, Hiroshi, 4,049,575, Cl. 252-439.000.
Nakanishi, Mutsuo; and Schmidt, Hans, to Matsushita Electric Company of America. Adjustable potentiometer assembly. 4,050,050, Cl. 338-190.000.
Nakaniwa, Mikio: *See*—
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,049,538, Cl. 208-50.000.
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Nakayama, Hiroo: *See*—
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Nakazawa, Makoto: *See*—
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Nalco Chemical Company: *See*—
Hunter, Wood E.; and Sieder, Theodore P., 4,049,606, Cl. 260-29.4UA.
Naryshkin, Jury Anatolievich: *See*—
Pomeschikov, Andrei Grigorievich; Buryagin, Firs Alexandrovich; Kazantsev, Lev Seliverstovich; Skvortsov, Gennady Fedorovich; Naryshkin, Jury Anatolievich; and Gracheva, Zinaida Ivanovna, 4,049,901, Cl. 13-9.0ES.
Nason, George F., III; and Winter, Walter W., to Systex, Inc. Training system for telephone switchboard operators using computer central processing unit. 4,048,728, Cl. 35-8.00A.
National Blank Book Company, Inc.: *See*—
Wilson, Robert B., 4,049,119, Cl. 206-387.000.
National Distillers and Chemical Corporation: *See*—
Stiles, Claude J.; and Tomo, Daniel, 4,049,147, Cl. 215-12.00R.
National Petro Chemicals Corporation: *See*—
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,049,896, Cl. 526-129.000.
National Research Development Corporation: *See*—
Attwood, Alan; and Laithwaite, Eric Roberts, 4,049,983, Cl. 310-13.000.
Firth, Donald; and Cunningham, Sinclair Upton, 4,048,906, Cl. 91-491.000.
Hiles, Maurice Arthur Frederick, 4,049,396, Cl. 51-295.000.
Pettigrew, Robert Martin, 4,049,965, Cl. 250-237.00G.
National Semiconductor Corporation: *See*—
Russell, Ronald W., 4,050,030, Cl. 330-23.000.
Shieu, Mark S. D.; Johnson, Robert B.; and Laugesen, Ronald C., 4,049,979, Cl. 307-270.000.
Natsugari, Hideaki: *See*—
Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, 4,049,812, Cl. 424-263.000.
Navi, Menashe, to Adolph Gottscho, Inc. Apparatus for repetitive imprinting at uniform increments on a continuously moving web. 4,048,913, Cl. 101-27.000.
Naylor, Charles A.: *See*—
Knowles, C. Harry; Meckley, John R.; and Naylor, Charles A., 4,050,037, Cl. 331-94.50D.
NCR Corporation: *See*—
Giessner, Frank, 4,049,108, Cl. 197-1.00R.
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Copperi, Maurizio; and Nebbia, Luciano, 4,049,917, Cl. 179-15.0AP.
Neff Folding Box Company: *See*—
Cope, Kenneth, 4,049,116, Cl. 206-176.000.
Negi, Virendra S.: *See*—
Miu, Ming T.; Negi, Virendra S.; and Lemay, Richard A., 4,050,097, Cl. 364-200.000.
Neidhardt, Manfred: *See*—
Bockstiegel, Gerd-Edzard; Neidhardt, Manfred; Rehfeld, Gerhard; and Umlauf, Werner, 4,049,397, Cl. 51-309.00A.
Neiman, S.A.: *See*—
Jawdoszyn, Claude, 4,049,932, Cl. 200-44.000.
Nekut, Edith Mayaud, to RCA Corporation. Reverse-printing method for producing cathode-ray-tube-screen structure. 4,049,452, Cl. 96-36.100.
Nelson, James E.: *See*—
Sullivan, John L.; Knauber, Veronica A.; and Nelson, James E., 4,049,164, Cl. 224-5.00W.
Nelson, Paul A.: *See*—
Vissers, Donald R.; Nelson, Paul A.; Kaun, Thomas D.; and Tomczuk, Zygmunt, 4,048,715, Cl. 29-623.500.
Nemechek, Alfred Emmerich: *See*—
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Petrov, Peter Dimitrov; and Punchev, Simeon Georgiev, 4,049,172, Cl. 226-90.000.
Nemeth, Janos: *See*—
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Neubert, Jurgen: *See*—
Armbrust, Ludwig; and Neubert, Jurgen, 4,049,860, Cl. 428-201.000.
Neumann, Barbara Susan, to Laporte Industries Limited. Production of magnesium silicates. 4,049,780, Cl. 423-331.000.
Neuzil, Richard W.; and deRosset, Armand J., to UOP Inc. Process for separating esters of fatty acids by selective adsorption. 4,049,688, Cl. 260-428.000.
Neveux, Rene Elie, to Societe Anonyme Francaise du Ferodo. Vacuum control valve. 4,049,020, Cl. 137-625.110.
Newell, Thomas J., III: *See*—
Bottomley, William K., 4,049,798, Cl. 424-195.000.
Newlon, Robert L., to Lawrence Brothers Inc. Security hinge having adjustable cam operator and reciprocable cam follower actuated switch. 4,049,934, Cl. 200-61.700.
Newman, Donald John; and Dunphy, Gerald Francis, to Ogden Industries Pty. Limited. Hydraulic door closer with adjustable time delay dampener. 4,048,694, Cl. 16-52.000.
Neyret, Guy, to Societe Anonyme dite: Etablissements Genoud & Cie. Cigarette lighter with presale tamper protection. 4,049,370, Cl. 431-144.000.
Nicklin, Thomas; and Hughes, Dorothy, to British Gas Corporation. Method of removing hydrogen sulfide from gases and liquids. 4,049,776, Cl. 423-226.000.
Niesgoda, Tassilo: *See*—
Hank, Dietrich; Lipfert, Gerhard; and Niesgoda, Tassilo, 4,049,213, Cl. 242-57.100.
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van der Lely, Cornelis; and Nieuwenhoven, Hendricus Jacobus Cornelis, 4,048,769, Cl. 52-79.700.
Nightingale, Douglas John, to Rolls-Royce (1971) Limited. Nozzles for gas turbine engines. 4,049,199, Cl. 239-265.390.
Nigro, Louis V., to Gillette Company, The. Tampon inserter. 4,048,998, Cl. 128-263.000.
Nihon Koki Kabushi Kaisha: *See*—
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.
Nijman, John Peter, to Bunker Ramo Corporation. Conductor terminating apparatus. 4,048,710, Cl. 29-566.400.
Nikkai Giken Co., Ltd.: *See*—
Fukushima, Yoshikiyo; and Watanabe, Shigeru, 4,048,805, Cl. 61-56.000.
Nikolenko, Ignat Leontievich: *See*—
Axelrod, Iosif Maxovich; Alengoz, Anton Savvich; Luchko, Viktor Nikolaevich; Mukhin, Valentin Alexandrovich; Nikolenko, Ignat Leontievich; and Potapenko, Igor Alexandrovich, 4,048,693, Cl. 15-310.000.
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Kutschke, C. T., 4,049,480, Cl. 156-94.000.
Nippert Company, The: *See*—
Nippert, Russell A., 4,049,185, Cl. 228-155.000.
Nippert, Russell A., to Nippert Company, The. Method of forming double extruded mount. 4,049,185, Cl. 228-155.000.
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Tujimoto, Hiroaki; Maki, Tatuya; Suganuma, Sadao; and Sano, Takctora, 4,049,556, Cl. 252-3.000.
Nippon Concrete Industries Co. Ltd.: *See*—
Fukushima, Yoshikiyo; and Watanabe, Shigeru, 4,048,805, Cl. 61-56.000.
Nippon Electric Company, Ltd.: *See*—
Noguchi, Tsutomu; Akaiwa, Yoshihiko; and Katoh, Hidehiko, 4,050,038, Cl. 333-1.100.
Sakoe, Hiroaki, 4,049,913, Cl. 179-1.0SD.
Nippon Electric Glass Company, Limited: *See*—
Shimizu, Hiroshi; Nishidai, Jun; and Yasuta, Toru, 4,049,899, Cl. 13-6.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Gocho, Makio; Ota, Masanori; and Kuraishi, Tatsuo, 4,048,849, Cl. 73-105.000.
Mori, Toshihiro; and Ando, Seigo, 4,050,011, Cl. 324-40.000.
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.
Nippon Steel Corporation: *See*—
Nakamura, Kunio; and Takahashi, Mitsuo, 4,049,439, Cl. 75-24.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.
Nippon Zeon Co., Ltd.: *See*—
Yamazaki, Masahiro, 4,049,765, Cl. 264-261.000.
Nirschl, Joseph C., to United States of America, Army. Range switching circuit for solid state electrometer. 4,050,019, Cl. 324-115.000.
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Itoh, Takuji; Nishikawa, Eiichiroh; Miura, Tadashi; and Yamahata, Takashi, 4,049,581, Cl. 252-466.0PT.
Nishikawa, Yoshio: *See*—
Nakai, Shiro; and Nishikawa, Yoshio, 4,049,011, Cl. 133-1.00A.
Nishimura Seisakusho Co., Ltd.: *See*—
Yamaguchi, Toshiaki; and Shoji, Jinichi, 4,049,212, Cl. 242-56.900.
Yamaguchi, Toshiaki; and Shoji, Jinichi, 4,049,214, Cl. 242-75.510.
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Ogawa, Hiroshi; Tamai, Yasuo; and Nishina, Tutomu, 4,049,871, Cl. 428-425.000.
Nishiyama, Keisuke: *See*—
Harimoto, Takeshi; and Nishiyama, Keisuke, 4,049,527, Cl. 204-198.000.
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Tanabe, Osamu; Nishizawa, Hisao; and Hata, Kazuo, 4,049,345, Cl. 355-41.000.
Nissan Motor Company: *See*—
Harada, Masanori; Katou, Shinzo; and Hayashi, Nobuyuki, 4,048,966, Cl. 123-117.00A.
Nissan Motor Company, Limited: *See*—
Aoyama, Syuniti, 4,048,968, Cl. 123-119.00A.
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Nissen, Axel; Fliege, Werner; and Voges, Dieter, to BASF Aktiengesellschaft. Manufacture of a catalyst composition containing zinc and nickel or cobalt. 4,049,571, Cl. 252-430.000.
Nitto Chemical Industry Co., Ltd.: *See*—
Sasaki, Yutaka; Morii, Akimitsu; Nakamura, Yoshimi; Moriya, Kiyoshi; and Utsumi, Hiroshi, 4,049,575, Cl. 252-439.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Hori, Yutaka; Honda, Zenzo; Suzuki, Kenji; Nakamoto, Keiji; and Yamamoto, Yoshiharu, 4,049,904, Cl. 174-107.000.
Nnadi, John C.; and Landis, Phillip S., to Mobil Oil Corporation. Substituted maleimide lubricant additives and lubricant compositions made therewith. 4,049,565, Cl. 252-51.50A.
Noguchi, Tsutomu; Akaiwa, Yoshihiko; and Katoh, Hidehiko, to Nippon Electric Company, Ltd. Edge-guided mode non-reciprocal circuit element for microwave energy. 4,050,038, Cl. 333-1.100.
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Yamamoto, Takaharu; Nomura, Toshio; Asai, Tsuyoshi; and Hara, Akio, 4,049,876, Cl. 428-932.000.
Norcon Electronics Inc.: *See*—
Schlaff, Norman; and Maltese, Mario, 4,049,911, Cl. 179-1.00H.
Nordemann, Bernhard: *See*—
Konig, Rolf; Nordemann, Bernhard; and Motek, Herbert, 4,049,206, Cl. 241-73.000.
Norman, Donald O.: *See*—
Shriver, Joe E.; and Norman, Donald O., 4,048,792, Cl. 56-98.000.
Norsk Hydro A.S.: *See*—
Mejdell, Glor Thorvald; and Kjolberg, Sven Arne, 4,049,773, Cl. 423-127.000.
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Francis, Gaylord L.; and Morelli, Amedeo J., 4,050,053, Cl. 338-332.000.
Northern Electric Company Limited: *See*—
Laing, Graham Stirling; and Ito, Shiro Tom, 4,049,925, Cl. 179-99.000.
Northern Telecom Limited: *See*—
Chu, Pak-Jong; and Audette, Jacques Marcel, 4,049,924, Cl. 179-90.00R.
Levi, Israel, 4,049,928, Cl. 179-170.00R.
Nothmann, Gerhard A., to Addressograph-Multigraph Corporation. Moisture system control apparatus. 4,048,920, Cl. 101-148.000.
Novar Electronics Corporation: *See*—
Ott, James H., 4,048,986, Cl. 128-2.00R.
Nozari, Mohammad S., to Minnesota Mining and Manufacturing Company. Abrasion resistant coatings. 4,049,861, Cl. 428-220.000.
Nunan, Denis M. Combination removable release ski binding. 4,049,291, Cl. 280-614.000.
Nyhus, Orville K., to Rockwell International Corporation. Signal combining apparatus. 4,050,072, Cl. 343-121.000.
Nystrom, Walter Albert, to Dresser Industries, Inc. Slip-type pliers tool. 4,048,878, Cl. 81-409.000.
O-3 Company: *See*—
Harter, Joseph William; and Beitzel, Stuart Wallace, 4,049,707, Cl. 250-531.000.
Oberlin, Claude: *See*—
Hatterer, Andre; Oberlin, Claude; and Strobel, Pierre, 4,049,443, Cl. 75-66.000.
Obidniak, Louis. Water filtration module. 4,049,550, Cl. 210-152.000.
Ochi, Kazushi: *See*—
Seko, Maomi; Miyake, Tetsuya; Inada, Kohji; Ochi, Kazushi; and Sakamoto, Tomio, 4,049,769, Cl. 423-7.000.
Oda, Tatsuro: *See*—
Adachi, Terufumi; and Oda, Tatsuro, 4,049,517, Cl. 204-159.180.
Oden, Laurance L.; Sanker, Philip E.; and Russell, James H., to United States of America, Interior. Method for producing supported Raney nickel catalyst. 4,049,580, Cl. 252-466.00J.
Odermann, Charles R.; Peterson, Wesley R.; Herr, John A.; and Porter, Oswald M., to Singer Company, The. Bight stop mechanism for sewing machines. 4,048,932, Cl. 112-158.00E.
Ogawa, Hiroshi; Tamai, Yasuo; and Nishina, Tutomu, to Fuji Photo Film Co., Ltd. Magnetic recording material. 4,049,871, Cl. 428-425.000.
Ogden Industries Pty. Limited: *See*—
Newman, Donald John; and Dunphy, Gerald Francis, 4,048,694, Cl. 16-52.000.
Ogisu, Kenji: *See*—
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Fujita, Tadao, 4,049,507, Cl. 204-39.000.

Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Enomoto, Masahisa, 4,049,530, Cl. 204-273.000.

Ohkubo, Kazuo: *See*—
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,049,645, Cl. 260-239.00B.

Ohno, Shigeo: *See*—
Mineo, Masatoshi; Oka, Ken-ichiro; Nakagawa, Kiyoshi; Matsuda, Hiyoshi; Ohno, Shigeo; and Takagi, Yasuo, 4,049,763, Cl. 264-176.00F.

Ohsawa, Misuo, to Sony Corporation. MPX stereo signal demodulator. 4,049,918, Cl. 179-15.0BT.

Ohta, Masao: *See*—
Manabe, Toshikatsu; Ohta, Masao; Kudo, Tetsuichi; Mochizuki, Shouji; and Gejyo, Tetsuo, 4,049,789, Cl. 423-593.000.

Oka, Ken-ichiro: *See*—
Mineo, Masatoshi; Oka, Ken-ichiro; Nakagawa, Kiyoshi; Matsuda, Hiyoshi; Ohno, Shigeo; and Takagi, Yasuo, 4,049,763, Cl. 264-176.00F.

Okamoto, Hiroyuki; Tsuda, Yoshio; and Yokoyama, Kazumasa, to Green Cross Corporation, The. Method of preparing labelled vegetable oil. 4,049,683, Cl. 260-410.700.

Okamoto, Kenzi, to Fujitsu Ten Limited. Apparatus for shifting the magnetic tape head in a multitrack tape player. 4,050,089, Cl. 360-106.000.

Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-naphthalenesulfonyl-L-arginine derivatives, and the pharmaceutically acceptable acid addition salts thereof. 4,049,645, Cl. 260-239.00B.

Oki Electric Industry Co., Ltd.: *See*—
Kishi, Hajimu; and Takahashi, Masashi, 4,050,001, Cl. 318-625.000.

Okita, Koichi; and Sakane, Isamu, to Sumitomo Electric Industries, Ltd. Porous films of polytetrafluoroethylene and process for producing said films. 4,049,589, Cl. 260-2.50M.

Okonite Company, The: *See*—
Ellers, Fred S.; Hally, Hugh G.; McIlveen, Edward E.; and Doble, William A., 4,048,807, Cl. 61-105.000.

Okubo, Hiroshi: *See*—
Ito, Akihiko; Kaetsu, Isao; Okubo, Hiroshi; Kato, Masamichi; Hayashi, Koichiro; and Maeda, Yuji, 4,049,867, Cl. 428-412.000.

Okuda, Hiroshi, to Sony Corporation. Apparatus for selecting playback or recording modes in magnetic recording and/or reproducing apparatus. 4,050,088, Cl. 360-96.000.

Okumura, Munehiro: *See*—
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Oldenburg, Dorrance; and Fischer, Robert L., to Caterpillar Tractor Co. Chain delimber assembly for tree harvester. 4,049,032, Cl. 144-2.00Z.

Olin Corporation: *See*—
Watson, W. Gary; and Breedis, John F., 4,049,426, Cl. 75-153.000.

Olinkraft, Inc.: *See*—
Harris, Thomas C.; and DeCrane, Charles E., 4,049,028, Cl. 141-10.000.

Olivier, Daniel E.: *See*—
Valenziano, Frank P.; and Olivier, Daniel E., 4,048,779, Cl. 52-726.000.

O'Nan, Alex, Jr.: *See*—
Goldsmith, Jesse M.; and O'Nan, Alex, Jr., 4,049,405, Cl. 55-479.000.

O'Neill, James L., to Merkert Enterprises, Inc. Mailing and storage box. 4,049,190, Cl. 206-611.000.

Ono, Fumio; and Aoyama, Yasuo, to Kikkoman Shoyu Co., Ltd. Novel composition containing fats or oils and method for manufacturing same. 4,049,831, Cl. 426-72.000.

Ono, Kenichi: *See*—
Kobashi, Toshiyuki; Ozaki, Masahiko; Ono, Kenichi; and Abe, Noboru, 4,049,605, Cl. 260-29.6AN.

Oosterwijk, Hendrik Harm Jannes; Wiersum, Ulfert Elle; Magre, Eduard Pieter; and van Dijk, Johannes Hendrinus, to Akzona Incorporated. Fire retardant compounds. 4,049,726, Cl. 260-649.00R.

Orban, Jean: *See*—
Vital, Zoltan; and Orban, Jean, 4,049,996, Cl. 315-151.000.

Ordonez, Marino Paneda. Lifting mechanisms for truck bodies. 4,049,316, Cl. 298-22.00B.

Oregon Patent Development Company: *See*—
Arff, John H., 4,049,552, Cl. 210-192.000.

Orelup, Richard B., to Morton-Norwich Products, Inc. Colored petroleum-derived product. 4,049,393, Cl. 44-59.000.

Orion Research Incorporated: *See*—
Ross, James W., Jr.; and Diggens, Albert A., 4,049,382, Cl. 23-230.00R.

O'Rourke, James L. Toothbrush with dentifrice attachment. 4,049,354, Cl. 401-134.000.

Osaki, Tatsuo: *See*—
Kawakami, Koichi; and Osaki, Tatsuo, 4,049,155, Cl. 221-192.000.

O'Shea, Francis X.: *See*—
Mao, Chung-Ling; and O'Shea, Francis X., 4,049,636, Cl. 260-77.5CR.

Ostbergs Fabriks AB: *See*—
Forslund, Erik Torsten, 4,048,733, Cl. 37-2.00R.

Ostermayer, Franz: *See*—
Jaeggi, Knut A.; Schroter, Herbert; and Ostermayer, Franz, 4,049,797, Cl. 424-180.000.

Osterreichisch-Amerkianische Magnesit Aktiengesellschaft: *See*—
Mortl, Gunther Lorenz; Werthmann, Eckhart; and Zoglmeyr, Gunther, 4,049,461, Cl. 106-56.000.

Ostrenko, Viktor Yakovlevich: *See*—
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.

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Yanagisawa, Takeshi; and Osuga, Motoyuki, 4,050,066, Cl. 340-388.000.

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Gocho, Makio; Ota, Masanori; and Kuraishi, Tatsuo, 4,048,849, Cl. 73-105.000.

Otis Engineering Corporation: *See*—
Arendt, Henry P., 4,049,052, Cl. 166-183.000.

Ott, James H., to Novar Electronics Corporation. Individual identification and diagnosis using wave polarization. 4,048,986, Cl. 128-2.00R.

Otto, Kenneth Wayne; and Hatten, Jimmy L., to Du Pont de Nemours, E. I., and Company. Chlorination of butadiene. 4,049,729, Cl. 260-654.00H.

Otzen, Karl G., to Safety-Kleen Corporation. Safety device for open receptacle. 4,049,551, Cl. 210-163.000.

Ouska, Ralph C.; and Bertaud, Francois X., to Stephens-Adamson, Inc. Subassembly cartridge for sealing and adjusting bearing assemblies. 4,049,328, Cl. 308-187.100.

Overhead Door Corporation: *See*—
Dietrich, Alfred T.; and Galbreath, Gerald W., 4,049,311, Cl. 296-24.00R.

Owatonna Tool Company: *See*—
McClocklin, Samuel B., 4,049,019, Cl. 137-625.210.

Owens-Illinois, Inc.: *See*—
Bower, Thomas E., 4,049,120, Cl. 206-396.000.
Go, Santos W., 4,049,631, Cl. 260-75.00S.
Mold, Donald F.; and Rice, Ronald G., 4,049,049, Cl. 165-165.000.
Mold, Donald F.; and Rice, Ronald G., 4,049,050, Cl. 165-165.000.
Pei, Yu Kun, 4,048,982, Cl. 126-271.000.
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Owings, Peter Russell; Beckering, Jacobus Jan; and Bunyea, Roderick Francis, to Black and Decker Manufacturing Company, The. Modular cordless tools. 4,050,003, Cl. 320-2.000.

Oxy Metal Industries Corporation: *See*—
Maurer, James I., 4,049,526, Cl. 204-195.00M.

Oy Innovation Services Co.: *See*—
Hatakka, Vesa; and Sarvela, Jussi, 4,049,143, Cl. 214-390.000.

Oy Tampella AB: *See*—
Romantschuk, Hakan Wilhelm; and Vuojolainen, Tuomo Juhani, 4,049,787, Cl. 423-563.000.

Ozaki, Masahiko: *See*—
Kobashi, Toshiyuki; Ozaki, Masahiko; Ono, Kenichi; and Abe, Noboru, 4,049,605, Cl. 260-29.6AN.

Package Products Company, Inc.: *See*—
Castleman, Howard H.; and Stewart, Henry G., 4,048,736, Cl. 40-2.00R.

Pagliaro, Vincent A.; and Walters, Richard G., to Printing Developments. Inc. Composite developer-etch composition for chromium-plated lithographic printing plates. 4,049,453, Cl. 96-36.300.

Paitson, John Lloyd; and Anderson, Clifford E., to Western Geophysical Co. of America. Marine acoustic pulse train signal generator. 4,049,078, Cl. 181-120.000.

Palmer, Ansell W.: *See*—
Germer, Warren R.; and Palmer, Ansell W., 4,050,020, Cl. 324-116.000.

Parker, Kenneth O., to Garrett Corporation, The. Heat exchanger with variable thermal response core. 4,049,051, Cl. 165-166.000.

Pasbrig, Max, to Lacrex Brevetti S.A. Coin holder. 4,049,115, Cl. 206-.840.

Pascente, Joseph E. Solid-state voltage switching circuit. 4,049,976, Cl. 307-252.00T.

Patel, Harish A., to Kendall Company, The. Disposable cold pack for blood specimen. 4,049,408, Cl. 62-4.000.

Patel, Kanti D., to Mortell Company. Weldable corrosion resistant primer material. 4,049,600, Cl. 260-22.0EP.

Patterson, W. W., III; and Grapes, Eugene F. Container lash systems. 4,048,938, Cl. 114-75.000.

Pattison, Victor A.: *See*—
Pawlak, Joseph A.; Lemper, Anthony L.; and Pattison, Victor A., 4,049,629, Cl. 260-47.00C.

Paufve, Eldred H., to Universal Instruments Corporation. Sequence component tester. 4,050,017, Cl. 324-73.0AT.

Paul Anderson Industrier AB: *See*—
Mattson, Arne, 4,049,237, Cl. 254-106.000.

Paulus, Wilfried; Scheinpflug, Hans; and Genth, Hermann, to Bayer Aktiengesellschaft. 2-Amino-1,3-thiazines their use and preparation. 4,049,807, Cl. 424-246.000.

Pawlak, Joseph A.; Lemper, Anthony L.; and Pattison, Victor A., to Hooker Chemicals & Plastics Corporation. Solution polycondensation method. 4,049,629, Cl. 260-47.00C.

Pawlikowski, Stanley Leonard; and Penird, Carl William, to GTE Sylvania Incorporated. CRT screen exposure device utilizing improved light means. 4,050,080, Cl. 354-1.000.

Pearl, David R., to Gerber Garment Technology, Inc. Cutter mechanism for cutting sheet material. 4,048,891, Cl. 83-528.000.

Pechmeze, Jacques Pierre Edmond, to Produits Chimiques Ugine Kuhlmann. Process for dyeing synthetic fibers formed from aromatic polyesters and new monoazo dyestuffs useful for such dyeing. 4,049,375, Cl. 8-41.00C.

Peck, Gregory George Alexander, to Identicar Corporation of America. Stenciling apparatus and identification system. 4,048,918, Cl. 101-114.000.

Peck, Richard John, to Bell Telephone Laboratories, Incorporated. Digital modulator. 4,049,909, Cl. 178-67.000.

Peerman, Dwight E.; Swan, Dale G.; and Kanten, H. Gordon, to General Mills Chemicals, Inc. Amino-poly(amidazoline-amide). 4,049,598, Cl. 260-18.00N.

Pegnim, Timothy C.; France, Larry R.; Sherman, John G.; and MacQuignon, Claude, to Cambridge Instrument Company, Inc. Electrocardiographic apparatus with recording pen protector. 4,050,079, Cl. 346-145.000.

Pei, Yu Kun, to Owens-Illinois, Inc. Bulb-type solar energy collector. 4,048,982, Cl. 126-271.000.

Pei, Yu Kun, to Owens-Illinois, Inc. Solar energy collector apparatus. 4,048,983, Cl. 126-271.000.

Peil, William: *See—*
McFadyen, Robert J.; and Peil, William, 4,050,022, Cl. 325-315.000.

Peisner, Israel Daniel, to Whitehead & Kales Company. Hook. 4,049,229, Cl. 248-503.000.

Pemberton, Robert E. Friction drive. 4,048,863, Cl. 74-229.000.

Penird, Carl William: *See—*
Pawlikowski, Stanley Leonard; and Penird, Carl William, 4,050,080, Cl. 354-1.000.

Pennsylvania Engineering Corporation: *See—*
Ziegler, Joseph, 4,049,246, Cl. 266-158.000.

Pennwalt Corporation: *See—*
Sandler, Stanley R., 4,049,612, Cl. 260-31.80R.

Pennzoil Company: *See—*
Kidwell, Louis E., Jr., 4,049,893, Cl. 526-26.000.

Penton, Harold Roy, Jr., to Akzona Incorporated. Method for improving disperse dyeability of polyesters and product thereof. 4,049,633, Cl. 260-75.00T.

Pentti, Heikki, to Kemi Oy. Method of curing plastic raw materials impregnated in a porous stuff such as wood. 4,049,850, Cl. 427-377.000.

Penzien, Klaus: *See—*
Fleig, Helmut; Hagen, Helmut; Naarmann, Herbert; and Penzien, Klaus, 4,049,622, Cl. 260-2.5HB.

Perego, Giuseppe, to Perego-Pines S.p.A. Baby carriage foldable in width and shortenable in height so as to be easily carried on a person's arm like an umbrella. 4,049,292, Cl. 280-642.000.

Perego-Pines S.p.A.: *See—*
Perego, Giuseppe, 4,049,292, Cl. 280-642.000.

Perino B. Wingfield: *See—*
Burks, Howard L., 4,049,154, Cl. 221-76.000.

Perkin-Elmer Corporation, The: *See—*
Dolgen, Igor E., 4,049,134, Cl. 214-29.000.
Helms, Charles Carlyle, 4,049,987, Cl. 313-112.000.

Perkin-Elmer Limited: *See—*
Ford, Michael Alan, 4,049,970, Cl. 250-461.00B.

Perklev, Torsten: *See—*
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,799, Cl. 424-211.000.
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,800, Cl. 424-211.000.

Perrey, Hermann; Schulze, Jurgen; Rosenkranz, Hans Jurgen; Rudolph, Hans; and Hornle, Reinhold, to Bayer Aktiengesellschaft. Dyestuff preparations. 4,049,378, Cl. 8-87.000.

Persson, Lennart Gerhard, to AB Akerlund & Rausing. Package. 4,049,188, Cl. 229-14.0BL.

Peterpaul, Joseph, to Thomas & Betts Corporation. Die means having workpiece releasing means. 4,048,839, Cl. 72-412.000.

Peters, Arnold: *See—*
Skrypek, John P.; and Peters, Arnold, 4,048,917, Cl. 101-40.000.

Petersen, Ross K. Air supply apparatus. 4,048,911, Cl. 98-39.000.

Peterson, David C., to Upjohn Company, The. 9-Deoxy-PGD-type, 1,15-lactones. 4,049,678, Cl. 260-343.410.

Peterson, Glenn E.; Emerson, Robert T.; and Schoenlein, William J., to Columbia Ribbon & Carbon Mfg. Co., Inc. Direct ribbon inking by gravure. 4,048,952, Cl. 118-6.000.

Peterson, Paul F., to United States of America, Air Force. Ejector rack for nuclear stores. 4,049,222, Cl. 244-137.00R.

Peterson, Wesley R.: *See—*
Odermann, Charles R.; Peterson, Wesley R.; Herr, John A.; and Porter, Oswald M., 4,048,932, Cl. 112-158.00E.

Petro-Tex Chemical Corporation: *See—*
Kerr, Ralph O.; and Barone, Bruno J., 4,049,574, Cl. 252-437.000.
Manning, Harold E., 4,049,579, Cl. 252-455.00R.

Petrolite Corporation: *See—*
Wagner, Oliver, 4,049,520, Cl. 204-186.000.
Winslow, Joseph D., Jr., 4,049,535, Cl. 204-305.000.

Petrov, Peter Dimitrov: *See—*
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Petrov, Peter Dimitrov; and Punchev, Simeon Georgiev, 4,049,172, Cl. 226-90.000.

Petter, Franz: *See—*
Baumann, Jan; and Petter, Franz, 4,049,363, Cl. 416-157.00B.

Pettigrew, Robert Martin, to National Research Development Corporation. Measurement apparatus. 4,049,965, Cl. 250-237.00G.

Pettipher, Rodney; Viellevoye, Lucien Nicolas Leon; and Kruithof, Albert, to International Standard Electric Corporation. Call load sharing system between a plurality of data processing units. 4,050,095, Cl. 364-200.000.

Pettit, Marshall G. Condition-responsive spring driven actuator. 4,050,047, Cl. 337-408.000.

Pfister, Gustav R.; and Maher, James C., to Xerox Corporation. Optical signal amplifier. 4,050,027, Cl. 330-5.000.

Pfizer Inc.: *See—*
Froberg, Robert W., 4,048,953, Cl. 118-49.000.

Pfluger, Erich: *See—*
Freissmuth, Alfred; Heinl, Walter; Knahl, Herbert; and Pfluger, Erich, 4,049,442, Cl. 75-55.000.

Philagro: *See—*
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.

Phillips Petroleum Company: *See—*
Cleary, James W., 4,049,635, Cl. 260-75.00R.
Drehman, Lewis E.; and Farha, Floyd, Jr., 4,049,743, Cl. 260-681.50R.
Fromm, Ellsworth H.; and Murray, Norman R., 4,049,021, Cl. 137-625.310.
Kraus, Wayne P.; and Hutson, Thomas, Jr., 4,049,728, Cl. 260-653.600.
Moczygemba, George A., 4,049,753, Cl. 260-880.00B.
Wier, Donald R., 4,049,054, Cl. 166-273.000.

Physics International Company: *See—*
Godfrey, Charles S., 4,049,056, Cl. 166-299.000.

Pictorial Machinery Limited: *See—*
Austin, Cecil Alfred, 4,049,346, Cl. 355-45.000.

Pielemeier, John William, to Whirlpool Corporation. Ramped scrubbing vanes for auger agitator. 4,048,820, Cl. 68-133.000.

Pierce, John H., to John Pierce Co., Inc., The. Strand winding apparatus. 4,049,210, Cl. 242-18.00R.

Pierrel, Michel: *See—*
Fort, Pierre Henri Marie; and Pierrel, Michel, 4,049,043, Cl. 164-295.000.

Pierron, Claude Raymond: *See—*
Bonnard, Louis Antoine; and Pierron, Claude Raymond, 4,048,888, Cl. 83-89.000.

Piers, Eugene. Couplings for metal tubes. 4,049,295, Cl. 285-9.00M.

Piette, Leonard A., to Unipas, Inc. Apparatus for assembling an encapsulated wet motor circulator. 4,048,717, Cl. 29-732.000.

Pike, Leslie Clark: *See—*
Creasey, Norman Geoffrey; and Pike, Leslie Clark, 4,049,873, Cl. 428-447.000.

Pillon, Daniel Jean: *See—*
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.

Pipe Line Development Co., The: *See—*
Spisak, John A., 4,049,234, Cl. 251-149.900.

Pisarkiewicz, Tadeusz: *See—*
Dunikowski, Andrzej; Bednarczyk, Jan; Keska, Jerzy; Pisarkiewicz, Tadeusz; and Zamarski, Andrzej, 4,048,844, Cl. 73-32.00R.

Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, to International Flavors & Fragrances Inc. Processes for preparing enol esters. 4,049,682, Cl. 260-410.000.

Piusz, Peter G.: *See—*
Chu, Nori Y. C.; and Piusz, Peter G., 4,049,567, Cl. 252-300.000.

Piziali, Robert L.: *See—*
Korner, Anneliese F.; Piziali, Robert L.; and Ellsworth, Orval T., 4,048,684, Cl. 5-370.000.

Plain Brown Wrapper, Inc.: *See—*
Griffin, Donald C., 4,048,675, Cl. 2-93.000.

Plaza, Mario G.; and Trezise, Richard D., to Xerox Corporation. Print member carriage assembly. 4,049,109, Cl. 197-53.000.

Plessey Handel und Investments A.G.: *See—*
Williams, John Lloyd; Leaman, Roger John; Moberly, Robert Valentine; Stagg, Geoffrey Brian Kenneth; and Wisdom, Graham John, 4,050,059, Cl. 364-200.000.

Plessey Incorporated: *See—*
Frazee, Lawrence E., 4,050,048, Cl. 338-35.000.

Plevak, Lubomir: *See—*
Elsner, Burckhardt; Plevak, Lubomir; Lagodka, Gunter; and Rosenberg, Harry, 4,048,804, Cl. 61-45.00D.

Plumat, Emile; Baudin, Pol; Posset, Robert; and Autequitte, Jean-Marie, to Glaverbel-Mecaniver. Heat insulating screen. 4,048,978, Cl. 126-200.000.

Plumlee, Karl W.; and Vernon, Lonnie W., to Exxon Research & Engineering Co. Coal liquefaction process. 4,049,536, Cl. 208-10.000.

Plumlee, Karl W.; and Vernon, Lonnie W., to Exxon Research & Engineering Co. Coal liquefaction process. 4,049,537, Cl. 208-10.000.

Pohl, Siegfried: *See—*
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,049,394, Cl. 48-62.00R.
Gernhardt, Paul; Grams, Wolfgang; Pohl, Siegfried; and Danguillier, Wilhelm, 4,049,570, Cl. 252-373.000.

Pohlke, Rolf, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for the preparation of 4-oxo-hexahydro-pyrazinoisoquinoline derivatives. 4,049,659, Cl. 260-268.0TR.

Polaroid Corporation: *See—*
Greenwald, Richard B., 4,049,450, Cl. 96-29.00R.

Politycki, Alfred; and Hieber, Konrad, to Siemens Aktiengesellschaft. Coating device for small electrically conductive components. 4,048,954, Cl. 118-49.100.

Pollack, Alan Ricky: *See*—
Marans, Nelson Samuel; and Pollack, Alan Ricky, 4,049,592, Cl. 260-2.5AD.

Polomski, John; Schulz, Willis Lorenz; and Specht, Victor Joseph, to Borg-Warner Corporation. Centrifugal and torque responsive lock up clutch for couplings. 4,049,094, Cl. 192-3.310.

Polychrome Corporation: *See*—
Chu, Simon L.; and Golda, Eugene, 4,049,504, Cl. 204-38.00A.

Pomagalski S.A.: *See*—
Thibaudon, Bruno, 4,049,999, Cl. 318-305.000.

Pomeschikov, Andrei Grigorievich; Buryagin, Firs Alexandrovich; Kazantsev, Lev Seliverstovich; Skvortsov, Gennady Fedorovich; Naryshkin, Jury Anatolievich; and Gracheva, Zinaida Ivanovna. Electroslag furnace. 4,049,901, Cl. 13-9.0ES.

Ponder & Best, Inc.: *See*—
Vital, Zoltan; and Orban, Jean, 4,049,996, Cl. 315-151.000.

Pont-A-Mousson S.A.: *See*—
Fort, Pierre Henri Marie; and Pierrel, Michel, 4,049,043, Cl. 164-295.000.
Sutter, Jean Georges, 4,050,000, Cl. 318-468.000.

Pool, Robert B. Lacross stick and preformed netting therefor. 4,049,273, Cl. 273-96.00D.

Poppe, Richard L.: *See*—
Childress, David L.; Hayes, William V.; and Poppe, Richard L., 4,049,577, Cl. 252-443.000.

Porter, John H., to Ladd Research Industries, Inc. Mixer for products contained in sealed envelopes. 4,049,242, Cl. 259-72.000.

Porter, Oswald M.: *See*—
Odermann, Charles R.; Peterson, Wesley R.; Herr, John A.; and Porter, Oswald M., 4,048,932, Cl. 112-158.00E.

Portier, Jean Louis, to Soletanche. Axial and annular magneto-elastic dynamometers. 4,048,851, Cl. 73-141.00A.

Portion Packaging Limited: *See*—
Johansen, Poul Egon, 4,048,781, Cl. 53-30.00R.

Porucznik, Paul: *See*—
Franek, Jozef Tadeusz; and Porucznik, Paul, 4,049,26[illegible], Cl. 271-269.000.

Posner, Israel, to E-C Apparatus Corporation. Electrophorectic apparatus for elution from preparative gels. 4,049,534, Cl. 204-299.00R.

Posset, Robert: *See*—
Plumat, Emile; Baudin, Pol; Posset, Robert; and Autequitte, Jean-Marie, 4,048,978, Cl. 126-200.000.

Potapenko, Igor Alexandrovich: *See*—
Axelrod, Iosif Maxovich; Alengoz, Anton Savvich; Luchko, Viktor Nikolaevich; Mukhin, Valentin Alexandrovich; Nikolenko, Ignat Leontievich; and Potapenko, Igor Alexandrovich, 4,048,693, Cl. 15-310.000.

Potoski, John R.: *See*—
Freed, Meier E.; and Potoski, John R., 4,049,701, Cl. 560-130.000.

Potts, Walter C. Extractor device. 4,049,307, Cl. 294-99.00R.

Powell, B. J.: *See*—
Savage, Donald D., 4,049,072, Cl. 180-64.00M.

PPG Industries, Inc.: *See*—
Brodmann, George, 4,049,870, Cl. 428-424.000.
Dent, Joseph B., Jr.; Martin, Walter L., Jr.; and Bennett, Howard M., 4,049,412, Cl. 65-2.000.
Dent, Joseph B., Jr., 4,049,415, Cl. 65-11.00W.
Long, David M.; and Dent, Joseph B., Jr., 4,049,411, Cl. 65-2.000.
Maaghul, John, 4,049,865, Cl. 428-391.000.
Motsinger, Donald L., 4,049,597, Cl. 260-18.0EP.
Schimmel, Karl F.; and Wismer, Marco, 4,049,637, Cl. 260-78.0TF.
Traister, Andrew; and Troup, Glenn, 4,049,596, Cl. 260-18.0EP.

Prater, Charles D.: *See*—
Kuo, James C.; Prater, Charles D.; and Wise, John J., 4,049,741, Cl. 260-676.00R.

Pratt, Albert R., to Raytheon Company. Knob with lock release means. 4,049,097, Cl. 192-8.00R.

Pratt, Wayne F., to K.A.L. Manufacturing Corporation. Welding apparatus. 4,049,943, Cl. 219-74.000.

Preobrazhensky, Alexandr Yakovlevich: *See*—
Vereschagin, Leonid Fedorovich; Yakovlev, Evgeny Nikolaevich; Varfolomeeva, Tatyana Dmitrievna; Preobrazhensky, Alexandr Yakovlevich; Slesarev, Vladislav Nikolaevich; Stepanov, Vasily Alexandrovich; and Shterenberg, Ljudmila Efimovna, 4,049,783, Cl. 423-446.000.

Prescher, Dietrich: *See*—
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.

Pressmaster Ltd.: *See*—
Undin, Hans, 4,048,877, Cl. 81-313.000.

Presto Lock Company, Division of Walter Kidde & Company, Inc.: *See*—
Bako, Lazlo; and Wingert, Rudolf, 4,048,821, Cl. 70-25.000.

Pribish, Bernard A.: *See*—
Morse, Donald B.; and Pribish, Bernard A., 4,048,887, Cl. 83-79.000.

Prible, Glen Virgil, to Combustion Engineering, Inc. Pipe insulation. 4,049,371, Cl. 432-234.000.

Price, Ellie Edward, Jr. Laterally engagable and releasable nut assembly. 4,048,897, Cl. 85-33.000.

Priefert Mfg. Co.: *See*—
Priefert, William D., 4,048,961, Cl. 119-96.000.

Priefert, William D., to Priefert Mfg. Co. Squeeze bar structure for a cattle chute. 4,048,961, Cl. 119-96.000.

Priest, John Garrick; and Tooth, Robert Barry, to Johnson, Matthey & Co., Limited. Vacuum transfer head and method of use. 4,049,484, Cl. 156-285.000.

Prince, Paul R.; Skehan, Bernard J.; and Hansen, Jay M., to Hughes Aircraft Company. Automatic light control system. 4,050,085, Cl. 358-219.000.

Printing Developments, Inc.: *See*—
Pagliaro, Vincent A.; and Walters, Richard G., 4,049,453, Cl. 96-36.300.

Pristelski, Stanley. Water tank heated by smoke from a furnace. 4,048,962, Cl. 122-20.00B.

Pritchett, Donald H. Fuel injection system. 4,048,971, Cl. 123-139.00R.

Procter & Gamble Company, The: *See*—
Collier, Everett J., 4,049,586, Cl. 252-532.000.
Elsnau, Walter Hugh, 4,049,792, Cl. 424-66.000.
Heckert, David Clinton, 4,049,585, Cl. 252-531.000.
Murphy, Alan P., 4,049,858, Cl. 428-136.000.

Produits Chimiques Ugine Kuhlmann: *See*—
Gueant, Auguste; and Mercier, Serge, 4,049,725, Cl. 260-638.00B.
Le Pape, Alain Yves, 4,049,376, Cl. 8-162.00R.
Pechmeze, Jacques Pierre Edmond, 4,049,375, Cl. 8-41.00C.
Schirmann, Jean-Pierre; and Weiss, Francis, 4,049,712, Cl. 260-554.000.
Weiss, Jean; and Zalmanski, Alain, 4,049,628, Cl. 260-47.0UA.

Prohoroff, Jack P.: *See*—
Hernandez, Armando C.; and Prohoroff, Jack P., 4,049,005, Cl. 131-187.000.

Prokai, Bela: *See*—
Kanner, Bernard; and Prokai, Bela, 4,049,674, Cl. 260-332.100.
Kanner, Bernard; and Prokai, Bela, 4,049,675, Cl. 260-332.100.

Prolizenz AG: *See*—
Schmidt, Walter, 4,049,250, Cl. 266-275.000.

Pugliese, Peter T., to Milmark Research, Inc. Bovine teat dip. 4,049,830, Cl. 424-343.000.

Pulker, Hans: *See*—
Lardon, Marcel; and Pulker, Hans, 4,049,352, Cl. 356-73.000.

Pullman Incorporated: *See*—
Glassmeyer, John J., 4,049,135, Cl. 214-38.0CC.

Punchev, Simeon Georgiev: *See*—
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Petrov, Peter Dimitrov; and Punchev, Simeon Georgiev, 4,049,172, Cl. 226-90.000.

Putter, Rolf: *See*—
Sundermann, Rudolf; Putter, Rolf; and Grigat, Ernst, 4,049,630, Cl. 260-47.00R.

Quack, Hans, to Sulzer Brothers Ltd. Refrigerating plant using helium as a refrigerant. 4,048,814, Cl. 62-335.000.

Quaker Oats Company, The: *See*—
Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., 4,049,832, Cl. 426-72.000.

Quast, Kenneth J.: *See*—
Rice, John F.; Yundt, Albert P.; and Quast, Kenneth J., 4,049,457, Cl. 96-88.000.

Quatrini, L. Rita; and MacInnis, Martin B., to GTE Sylvania Incorporated. Extraction process for recovery of rhenium. 4,049,771, Cl. 423-49.000.

Raab, Richard; Spindler, Kurt; Brand, Herbert; and Gast, Leonard, to DIEHL. Separating device for removing the press skin from a combined extrusion disc. 4,048,832, Cl. 72-255.000.

Raber, Ervin T.: *See*—
Mosley, Gerald; and Raber, Ervin T., 4,050,065, Cl. 340-347.0NT.

Radovsky, Jonathan Samuel, to RCA Corporation. Phase-splitter. 4,049,977, Cl. 307-262.000.

Rafferty, Edson D.: *See*—
Kletschka, Harold D.; and Rafferty, Edson D., 4,049,002, Cl. 128-318.000.

Raghavachari, Srinivas T.; and Striebel, Robert L., II, to MPL, Inc. Syringe with actinic radiation protection. 4,048,997, Cl. 128-215.000.

Rakowicz, Jan Antoni; and Harrison, Brian, to Molins Limited. Devices for applying adhesives to a moving web. 4,048,950, Cl. 118-6.000.

Ralston, Philip G., Jr., to Baxter Travenol Laboratories, Inc. Molded collapsible solution container. 4,049,033, Cl. 105-.500.

Ramberg, Kjell Oystein; and Kirknes, Bjorn, to Simrad A.S. Mechanism for gauging the catch within a trawl net. 4,048,850, Cl. 73-133.00R.

Ramsey, William S.: *See*—
Lepp, Cyrus A.; Mason, Robert D.; and Ramsey, William S., 4,049,499, Cl. 195-100.000.

Randell, Donald Richard: *See*—
Holt, Brian; and Randell, Donald Richard, 4,049,647, Cl. 542-426.000.

Rao, Bhaskara M. L.; and Silbernagel, Bernard G., to Exxon Research & Engineering Co. Solid electrolyte composition and cell. 4,049,881, Cl. 429-50.000.

Raschke, Curt R., to Addressograph-Multigraph Corporation. Electrostatic printing/duplicating method using polarization forces. 4,048,921, Cl. 101-426.000.

Raskin S.A.: *See*—
Aeschbach, Fritz, 4,048,890, Cl. 83-146.000.

Rasmussen, Hjorth, to Colgate-Palmolive Co. Free flowing phosphate ester compositions for post addition to detergents. 4,049,558, Cl. 252-8.900.

Rath, Heinrich Bernhard, to Girling Limited. Vehicle disc brakes. 4,049,086, Cl. 188-73.300.

Raudat, John L.; and Johnson, Lloyd D., to Emhart Industries, Inc. Case loader with invert grid and pushdown feature. 4,048,783, Cl. 53-61.000.

Ray, Lynn L. Racket string clamp. 4,049,268, Cl. 273-73.00A.

Raychem Corporation: *See—*
Schweiso, Robert J., 4,049,151, Cl. 220-201.000.
Siden, Dennis C., 4,049,334, Cl. 339-97.00R.

Raymond Lee Organization, Inc., The: *See—*
Blackmon, Macy B., 4,048,824, Cl. 70-456.00R.
Lawrence, James R., 4,048,756, Cl. 49-171.000.

Raynaud, Guy M.: *See—*
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,658, Cl. 260-268.0PC.
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,660, Cl. 260-268.0PC.

Raytheon Company: *See—*
Backman, William R., Jr.; and Chramiec, Mark A., 4,050,057, Cl. 340-3.00F.
Pratt, Albert R., 4,049,097, Cl. 192-8.00R.

RCA Corporation: *See—*
Bloom, Allen; and Bartolini, Robert Alfred, 4,049,459, Cl. 96-115.00R.
Clorfeine, Alvin Seymour, 4,050,071, Cl. 343-8.000.
Goodman, Alvin Malcolm, 4,050,018, Cl. 324-110.000.
Hang, Kenneth Warren, 4,049,872, Cl. 428-427.000.
Ladany, Ivan, 4,049,994, Cl. 313-499.000.
Law, Harold Bell, 4,049,451, Cl. 96-36.100.
Leedom, Marvin Allan, 4,049,280, Cl. 274-37.000.
Lozier, Gerald Scott; and Branin, Phyllis Brown, 4,049,845, Cl. 427-68.000.
Nekut, Edith Mayaud, 4,049,452, Cl. 96-36.100.
Radovsky, Jonathan Samuel, 4,049,977, Cl. 307-262.000.

Reagan, William J.; and Chen, Nai Y., to Mobil Oil Corporation. Hydrocarbon conversion catalyst. 4,049,578, Cl. 252-455.00R.

Reagan, William Joseph: *See—*
Chen, Nai Yuen; and Reagan, William Joseph, 4,049,735, Cl. 260-668.00R.

Reed Building Products, Pty. Limited: *See—*
Brookes, Cyril James, 4,048,676, Cl. 4-1.000.

Reesman, Stanley H.; and Eldred, Charles R., to General Foods Corporation. Process for preparing an expanded soy product. 4,049,840, Cl. 426-634.000.

Refratechnik GmbH: *See—*
Tutsek, Alexander; and Bartha, Peter, 4,049,464, Cl. 106-288.00B.

Regenbogen, Eberhard, to Richard Wolf GmbH. Shutter for a rectoscope. 4,048,988, Cl. 128-4.000.

Rehfeld, Gerhard: *See—*
Bockstiegel, Gerd-Edzard; Neidhardt, Manfred; Rehfeld, Gerhard; and Umlauf, Werner, 4,049,397, Cl. 51-309.00A.

Rei, Nuno M.; and Wilson, Ronald C., to Ventron Corporation. Microbiocidal compositions comprising a solution of a phenoxarsine compound. 4,049,822, Cl. 424-297.000.

Reica Kogyo Kabushiki Kaisha: *See—*
Taniguchi, Toru, 4,049,241, Cl. 259-4.0AC.

Reichelt, Walter; and Sauer, Gunter, to W. C. Heraeus GmbH. Electrical temperature measuring resistor structure, particularly for resistance thermometers. 4,050,052, Cl. 338-308.000.

Reid, Robert, to Daymond Limited. Structural member for a structural frame. 4,049,082, Cl. 182-217.000.

Reinecke, Erich, to WABCO Westinghouse GmbH. Safety circuit arrangement for wheel anti-skid brake control system. 4,049,325, Cl. 303-92.000.

Reinhard, Hans: *See—*
Eisentraeger, Klaus; Immel, Guenther; Marx, Matthias; Reinhard, Hans; Spoor, Herbert; and Storck, Gerhard, 4,049,847, Cl. 427-207.00B.

Rejto, Thomas. Simultaneous transfer printing and embossing or surface texturing method. 4,049,374, Cl. 8-2.50A.

Rek, Johannes Henricus Maria, to Lever Brothers Company. Process for the separation of triglycerides in an aqueous system. 4,049,687, Cl. 260-428.000.

Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., to National Petro Chemicals Corporation. Olefin polymerization catalyst. 4,049,896, Cl. 526-129.000.

Remington Arms Company, Inc.: *See—*
Alday, James Marion; and Rowlands, Kenneth Charles, 4,048,976, Cl. 124-47.000.

REMIX Radiotechnikai Vallalat: *See—*
Kadar, Ferenc; and Galambos, Gyula, 4,050,051, Cl. 338-202.000.

Rene Cosson S.A.: *See—*
Buljovcic, Stephan, 4,048,922, Cl. 102-92.700.

Reneau, Bobby J. Pipe coupling apparatus. 4,049,297, Cl. 285-24.000.

Rennhack, Rolf: *See—*
Bierbach, Herbert; Dittmar, Heinz; Heinz, Ernst; Hohmann, Klaus; and Rennhack, Rolf, 4,049,788, Cl. 423-592.000.

Research Corporation: *See—*
Fox, Charles L., Jr., 4,049,802, Cl. 424-229.000.

Restaino, Alfred Joseph, to ICI United States Inc. Stabilized polymerizable compositions. 4,049,731, Cl. 260-666.500.

Reuting, Hans-Werner; and Eggers, Hugo, to Elmeg Elektro-Mechanik GmbH. Electromagnetic system. 4,050,043, Cl. 335-237.000.

Rexnord Inc.: *See—*
Martin, Donald E., 4,049,308, Cl. 295-8.000.

Reynolds Metals Company: *See—*
Wallace, Joseph W., 4,048,934, Cl. 113-120.00H.

Reznikov, Efim Abramovich: *See—*
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.

RFD Systems Engineering Limited: *See—*
Edwards, Michael John, 4,048,730, Cl. 35-25.000.

Rhea, Charles K., Jr.: *See—*
Byrne, John A.; Rhea, Charles K., Jr.; and Fleming, Thomas F., 4,049,950, Cl. 235-61.60R.

Rhomberg, Alfred: *See—*
Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, 4,049,811, Cl. 424-258.000.

Rhone-Poulenc Industries: *See—*
Collet, Paul, 4,049,716, Cl. 260-573.000.

Rhone-Poulenc, S.A.: *See—*
Chabardes, Pierre; Julia, Marc; and Menet, Albert, 4,049,718, Cl. 260-590.00C.

Rhone-Progil: *See—*
Meiller, Francois, 4,049,691, Cl. 260-448.20N.

Rhoton, Albert L.: *See—*
Goodale, Clark W.; Morgan, Charles W.; and Rhoton, Albert L., 4,049,848, Cl. 427-244.000.

Rice, John F.; Yundt, Albert P.; and Quast, Kenneth J., to Bard Laboratories, Inc. Photosensitive composition of polynitrate ester, aromatic amines and organic esters. 4,049,457, Cl. 96-88.000.

Rice, Ronald G.: *See—*
Mold, Donald F.; and Rice, Ronald G., 4,049,049, Cl. 165-165.000.
Mold, Donald F.; and Rice, Ronald G., 4,049,050, Cl. 165-165.000.

Richard Wolf GmbH: *See—*
Regenbogen, Eberhard, 4,048,988, Cl. 128-4.000.

Richardson Company, The: *See—*
Muzyczko, Thaddeus M.; Frederiksen, Ronald A.; and York, David L., 4,049,746, Cl. 260-851.000.

Riches, Arthur John, to Bunker Ramo Corporation. Hand tool. 4,048,874, Cl. 81-57.310.

Richey, Vernon T. Apparatus for reducing annular back pressure near the drill bit. 4,049,066, Cl. 175-323.000.

Ricoh Company, Ltd.: *See—*
Isayama, Takuro; and Kubo, Kikuo, 4,050,078, Cl. 346-140.00R.
Tagawa, Kazuaki, 4,048,957, Cl. 118-653.000.

Ridley, Spriggs and Johnson Limited: *See—*
Johnson, Martin Robert, 4,048,819, Cl. 66-177.000.

Rieger, Georg: *See—*
Heinen, Richard; and Rieger, Georg, 4,048,875, Cl. 81-125.000.

Rieter Machine Works, Ltd.: *See—*
Spescha, Gelli, 4,049,211, Cl. 242-45.000.

Rigollot, Georges Alfred, to Agence Nationale de Valorisation de la Recherche (ANVAR). Anti-polluting power plant using compressors and gas turbines. 4,049,299, Cl. 290-52.000.

Rineer, Arthur E. Wind-driven rotor assembly. 4,049,362, Cl. 416-119.000.

Ring, Maurice Frank: *See—*
Beveridge, John; Davies, Thomas Roderick Harries; Fidler, Fred; and Ring, Maurice Frank, 4,048,935, Cl. 113-120.00F.

Ring, Michael: *See—*
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,049,491, Cl. 162-101.000.

Ringers, Hendrik Johan; and Segers, Jacobus Cornelis, to Lever Brothers Company. Degumming process for triglyceride oils. 4,049,686, Cl. 260-424.000.

Risi, Rene, to Bulova Watch Company, Inc. Timepiece calendar mechanism. 4,048,795, Cl. 58-4.00R.

Ritchie, William Barney, Jr.: *See—*
Bowley, Wallace William, 4,048,802, Cl. 61-5.000.

Ritter, Helmut, to Heberlein Maschinenfabrik AG. Drive with continuously adjustable speed variation. 4,048,864, Cl. 74-230.17F.

Ritter, Lawrence: *See—*
Haeger, Bruce Edwin; Krueger, James Elwood; Lowery, James Alfred; and Ritter, Lawrence, 4,049,809, Cl. 424-250.000.

Rivers, Richard D., to American Air Filter Company, Inc. Fluid filter housing and assembly. 4,049,406, Cl. 55-484.000.

Robert Bosch GmbH: *See—*
Bianchi, Valerio; Latsch, Reinhard; and Schmidt, Peter, 4,048,965, Cl. 123-32.0EA.
Krumbein, Fritz, 4,049,340, Cl. 352-166.000.
Stumpp, Gerhard, 4,048,967, Cl. 123-119.00A.
Worz, Paul, 4,048,972, Cl. 123-148.00D.

Roberts, David B., Jr.; and Wells, Joseph L. Hydroponic garden structure. 4,048,753, Cl. 47-59.000.

Roberts, Thomas Ernest Edwin, to Lucas Industries Limited. Rotary hydraulic machine having a valve responsive to rotor bore pressure and stator port pressure. 4,048,903, Cl. 91-6.500.

Robinson, C. Paul; Rockwood, Stephen D.; Jensen, Reed J.; Lyman, John L.; and Aldridge, Jack P., III, to United States of America, Energy Research and Development Administration. Laser isotope separation by multiple photon absorption. 4,049,515, Cl. 204-157.10R.

Robinson, Fred: *See—*
Steckler, Robert; Robinson, Fred; and Farmer, Robert F., III, 4,049,608, Cl. 260-29.6SQ.

Robinson, Norman: *See—*
Harper, Douglas Charles; Robinson, Norman; and Janikowski, Stanislaw Maria, 4,049,774, Cl. 423-167.000.

Rochester Button Company, The: *See*—
Hodgins, Howard A., 4,048,931, Cl. 112-121.270.
Rochestie, Barnett B., to Royal Engineering Company. Carpet sample display apparatus. 4,049,125, Cl. 211-47.000.
Rock, Steven L., to Rohm and Haas Company. Decolorization of effluents from pulp mills. 4,049,546, Cl. 210-30.00R.
Rockwell International Corporation: *See*—
Alers, George A.; and Thompson, Robert B., 4,048,847, Cl. 73-67.50R.
Anderson, Dean T.; and Vanous, Joseph A., 4,049,914, Cl. 179-2.50R.
Babcock, Gary D., 4,048,859, Cl. 73-516.00R.
Burton, C. Shepherd; Harker, Alan B.; and Ho, William W., 4,049,383, Cl. 23-232.00E.
Molina, Orlando G., 4,049,568, Cl. 252-301.190.
Nyhus, Orville K., 4,050,072, Cl. 343-121.000.
Rockwood, Stephen D.: *See*—
Robinson, C. Paul; Rockwood, Stephen D.; Jensen, Reed J.; Lyman, John L.; and Aldridge, Jack P., III, 4,049,515, Cl. 204-157.10R.
Roden, William A.; and Criger, Glenn L., to General Dynamics Corporation. Welding back-up tape. 4,049,183, Cl. 228-50.000.
Rodgers, Leonard John, to Rolls-Royce Limited. Ejector sleeves for aircraft mounted gas turbine engines. 4,049,220, Cl. 244-53.00R.
Rogers, Walter Clark, Jr., to Royal Development Company, Inc. Sofa bed and linkage mechanism. 4,048,680, Cl. 5-37.00R.
Rohde, Wolfgang; and Siebert, Werner, to Bergwerksverband GmbH. Method of charging a plurality of coking ovens. 4,049,141, Cl. 214-152.000.
Rohm and Haas Company: *See*—
Rock, Steven L., 4,049,546, Cl. 210-30.00R.
Rohrig, Josef: *See*—
Konig, Justus; Rohrig, Josef; and Hilliges, Friedrich, 4,049,922, Cl. 179-18.0AB.
Rolf Sporting Goods, Inc.: *See*—
Halverson, Lance K., 4,049,126, Cl. 211-104.000.
Rolls-Royce Limited: *See*—
Rodgers, Leonard John, 4,049,220, Cl. 244-53.00R.
Rolls-Royce (1971) Limited: *See*—
Nightingale, Douglas John, 4,049,199, Cl. 239-265.390.
Smith, Stanley, 4,049,401, Cl. 55-184.000.
Snell, Leonard Stanley, 4,049,360, Cl. 415-149.00R.
Roman, Steven A., to Shell Oil Company. Esters of nitro(tetrahydro-2H-1,3-thiazin-2-ylidene)acetic acid. 4,049,652, Cl. 544-54.000.
Romantschuk, Hakan Wilhelm; and Vuojolainen, Tuomo Juhani, to Oy Tampella AB. Process for separating sulphur in the form of hydrogen sulphide from clarified green liquor obtained from the combustion of waste liquor. 4,049,787, Cl. 423-563.000.
Rondeau, Benjamin G.: *See*—
Spencer, Clark V.; and Rondeau, Benjamin G., 4,048,837, Cl. 72-387.000.
Roose, Gerald L. Bale carrying and unrolling device. 4,049,140, Cl. 214-147.00G.
Ropp, Richard C., to Allied Chemical Corporation. Crystalline salt monomers for stable phosphate glasses. 4,049,779, Cl. 423-309.000.
Rose, Harold T.: *See*—
Schrader, William L.; and Rose, Harold T., 4,049,131, Cl. 214-14.000.
Rosenberg, Harry: *See*—
Elsner, Burckhardt; Plevak, Lubomir; Lagodka, Gunter; and Rosenberg, Harry, 4,048,804, Cl. 61-45.00D.
Rosenberg, William E., to Columbia Chemical Corporation. Baths and additives for the electrodeposition of bright zinc. 4,049,510, Cl. 204-55.00R.
Rosenkranz, Hans Jurgen: *See*—
Perrey, Hermann; Schulze, Jurgen; Rosenkranz, Hans Jurgen; Rudolph, Hans; and Hornle, Reinhold, 4,049,378, Cl. 8-87.000.
Schuster, Karl Ernst; Rosenkranz, Hans Jurgen; and Rudolph, Hans, 4,049,745, Cl. 260-837.00R.
Rosenquist, Kurt E.: *See*—
Hyman, David L.; Cayton, Robert J.; and Rosenquist, Kurt E., 4,049,038, Cl. 160-166.00A.
Ross, James W., Jr.; and Diggens, Albert A., to Orion Research Incorporated. Total residual chlorine. 4,049,382, Cl. 23-230.00R.
Ross, Joseph; and Fuchs, Ernest F., to Ace Envelope Manufacturing Corporation. Removable impeller assembly for printing press centrifugal pump. 4,049,364, Cl. 417-360.000.
Rossi, John P., to CBS Inc. Comb filter for television signals having adaptive features. 4,050,084, Cl. 358-31.000.
Rossmiller, Lawrence E.; and Gemar, George D. Swing mount pivotally supporting width gauge from vehicle. 4,049,062, Cl. 172-126.000.
Rote, Everett Arthur, to Xerox Corporation. Pin crimping apparatus and product therefrom. 4,048,718, Cl. 29-739.000.
Rotenberg, Don H.: *See*—
Laurin, Bernard L.; Rotenberg, Don H.; and Crandon, Harry D., 4,049,868, Cl. 428-412.000.
Rothe, Rudolf; and Kohler, Johann, to HAG Aktiengesellschaft. Method for transferring a highly compressed gas from a reactor to a storage tank with condensation of the gas. 4,049,409, Cl. 62-9.000.
Roulet, Pierre Alfred: *See*—
Fluckiger, Jean-Louis; and Roulet, Pierre Alfred, 4,049,946, Cl. 219-131.00R.
Rowbotham, Edwin M.: *See*—
Gale, Ronald J.; and Rowbotham, Edwin M., 4,049,037, Cl. 152-427.000.
Rowlands, Kenneth Charles: *See*—
Alday, James Marion; and Rowlands, Kenneth Charles, 4,048,976, Cl. 124-47.000.
Royal Development Company, Inc.: *See*—
Rogers, Walter Clark, Jr., 4,048,680, Cl. 5-37.00R.
Royal Engineering Company: *See*—
Rochestie, Barnett B., 4,049,125, Cl. 211-47.000.
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich. Method of manufacturing polymetallic pipes. 4,049,184, Cl. 228-131.000.
Rubin, Fred Kurt, to Lever Brothers Company. Method and compositions for removal of hard surface manganese ion-derived discolorations. 4,049,467, Cl. 134-2.000.
Rudbeck, Per-Olof Bertil, to Saab-Scania, Scania Division. Storage arrangement for vehicles. 4,049,312, Cl. 296-28.00A.
Rudolph, Hans: *See*—
Perrey, Hermann; Schulze, Jurgen; Rosenkranz, Hans Jurgen; Rudolph, Hans; and Hornle, Reinhold, 4,049,378, Cl. 8-87.000.
Schuster, Karl Ernst; Rosenkranz, Hans Jurgen; and Rudolph, Hans, 4,049,745, Cl. 260-837.00R.
Rudy, Erwin: *See*—
Yih, Stephen Wei Hong; Worcester, Samuel Austin, Jr.; and Rudy, Erwin, 4,049,380, Cl. 428-539.500.
Rugenstein, Robert W. Solar heated building structure. 4,049,195, Cl. 237-1.00A.
Rumm, Arnold. Flexible squeeze dispenser for liquid sealant. 4,049,160, Cl. 222-215.000.
Rundle, Frederick Stanley, to Shepard Niles Crane & Hoist Corporation. Electromagnetic brake assembly. 4,049,089, Cl. 188-171.000.
Russell, Donald H.; and Kremer, Charles J., to Atlantic Richfield Company. Permanent waving of human hair by means of crosslinking urethane and/or hydroxamate derived from reactive acrylic resins and adipodinitrile carbonate. 4,049,007, Cl. 132-7.000.
Russell, Herman F.: *See*—
Fullenkamp, Anthony L.; and Russell, Herman F., 4,048,689, Cl. 15-3.170.
Russell, James H.: *See*—
Oden, Laurance L.; Sanker, Philip E.; and Russell, James H., 4,049,580, Cl. 252-466.00J.
Russell, Ronald W., to National Semiconductor Corporation. Offset adjustment circuit. 4,050,030, Cl. 330-23.000.
Russell (Shears) Limited: *See*—
Gunson, Brennand, 4,048,721, Cl. 30-254.000.
Rybicki, Zbigniew: *See*—
Majewska, Janina; Grams, Wiktor; Rybicki, Zbigniew; and Banasiak, Jozef, 4,049,775, Cl. 423-224.000.
Ryer, Jack; Zielinski, James; Miller, Harold N.; and Brois, Stanley J., to Exxon Research & Engineering Co. Oxazoline derivatives as additives useful in oleaginous compositions. 4,049,564, Cl. 252-51.50A.
Ryusho Sangyo Kabushiki: *See*—
Sakakibara, Kaichi; and Sumida, Hiroyuki, 4,048,852, Cl. 73-193.00R.
S. C. Johnson & Son, Inc.: *See*—
Broadbent, David J., 4,049,460, Cl. 106-15.00R.
Lo, Vincent; Vos, Kenneth D.; and Suchla, Germane M., 4,049,158, Cl. 222-95.000.
Saab-Scania, Scania Division: *See*—
Rudbeck, Per-Olof Bertil, 4,049,312, Cl. 296-28.00A.
Saari, Oliver Edward, to Illinois Tool Works Inc. Mechanical device converting rotary input to linear compression or stretching output with a high mechanical advantage. 4,048,867, Cl. 74-424.80B.
Safety-Kleen Corporation: *See*—
Otzen, Karl G., 4,049,551, Cl. 210-163.000.
Safety Racing Equipment, Incorporated: *See*—
Blunier, Donald E., 4,049,085, Cl. 188-18.00A.
SAFT-Societe des Accumulateurs Fixes et de Traction: *See*—
Flender, Jacques, 4,049,888, Cl. 429-115.000.
Sagalyn, Paul L.; and Alexander, Michael N., to United States of America, Army. Spectrometer for external detection of magnetic and related double resonance. 4,050,009, Cl. 324-.5AC.
Saginaw Products Corporation: *See*—
Francis, George W., Jr., 4,049,286, Cl. 280-179.00R.
Saillant, Roger B.; and Weber, Neill, to Ford Motor Company. Thermoelectric generator. 4,049,877, Cl. 429-11.000.
Saint-Gobain Industries: *See*—
Guissard, Jean, 4,049,167, Cl. 225-2.000.
Saitner, Rudolf: *See*—
Bunge, Wilhelm; Last, Wolf-Dieter; Saitner, Rudolf; and Wolf, Karlheinz, 4,049,610, Cl. 260-31.20N.
Saito, Kenji: *See*—
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.
Saito, Shinroku: *See*—
Tominaga, Hiroshi; Yasunami, Kazuo; Saito, Shinroku; Takamatsu, Masanobu; and Sawaoka, Akira, 4,049,367, Cl. 425-77.000.
Saito, Tamaki: *See*—
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.
Sakakibara, Kaichi; and Sumida, Hiroyuki, to Kabushiki Kaisha Takuma; and Ryusho Sangyo Kabushiki. Integrating calorimeter. 4,048,852, Cl. 73-193.00R.

Sakamoto, Tomio: *See*—
Seko, Maomi; Miyake, Tetsuya; Inada, Kohji; Ochi, Kazushi; and Sakamoto, Tomio, 4,049,769, Cl. 423-7.000.

Sakane, Isamu: *See*—
Okita, Koichi; and Sakane, Isamu, 4,049,589, Cl. 260-2.50M.

Sakoe, Hiroaki, to Nippon Electric Company, Ltd. System for recognizing speech continuously spoken with number of word or words preselected. 4,049,913, Cl. 179-1.0SD.

Salen & Wicander Terminalsystem AB: *See*—
Stromback, Per, 4,049,132, Cl. 214-14.000.

Salomon, Georges Pierre Joseph. Ski-binding. 4,049,290, Cl. 280-613.000.

Salonimer, David J.; and Kelley, Buster E., to United States of America, Air Force. Passive optical transponder. 4,049,969, Cl. 250-458.000.

Salter, Larry, to Briles, Paul R., a part interest. Fastener for multi metal stack-ups. 4,048,898, Cl. 85-77.000.

Sammarco, Peter: *See*—
Storm, Donald P.; Sammarco, Peter; Fritz, Edward A.; and Mackert, Robert J., 4,049,207, Cl. 241-101.700.

Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Petrov, Peter Dimitrov; and Punchev, Simeon Georgiev, to Institute po Zavaryavane. Planetary wire-feeding mechanism for electric arc-welding applications. 4,049,172, Cl. 226-90.000.

Samuelson, Ivar J., to Manufacturers Brush Company, The. Non-cellular polyurethane wheel in a process for finishing a metal workpiece. 4,048,765, Cl. 51-328.000.

Sanda, Shoogo; and Nakamura, Norihiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine provided with precombustion chamber. 4,048,973, Cl. 123-191.0SP.

Sander, Nils Borje Lennart: *See*—
Stjarne, Anders Olov Gunnar; and Sander, Nils Borje Lennart, 4,049,088, Cl. 188-107.000.

Sandler, Stanley R., to Pennwalt Corporation. Metal phosphinates as smoke retardants for polyvinyl halides. 4,049,612, Cl. 260-31.80R.

Sandner, Michael Ray; and Duffy, Robert Donovan, to Union Carbide Corporation. Catalyst systems containing dimethylamino ether mono-ols for polyurethane foam formation. 4,049,931, Cl. 260-2.5AC.

Sandoz, Inc.: *See*—
Nadelson, Jeffrey, 4,049,813, Cl. 424-263.000.

Sandoz Ltd.: *See*—
Groebke, Wolfgang; and Korte, Klaus, 4,049,642, Cl. 260-196.000.
Laber, Georg; and Schutze, Eberhard, 4,049,817, Cl. 424-270.000.
Studer, Martin, 4,049,641, Cl. 260-191.000.

Sanker, Philip E.: *See*—
Oden, Laurance L.; Sanker, Philip E.; and Russell, James H., 4,049,580, Cl. 252-466.00J.

Sankyo Company Limited: *See*—
Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, 4,049,495, Cl. 195-36.00R.

Sanner, Axel: *See*—
Greif, Norbert; Fikentscher, Rolf; and Sanner, Axel, 4,049,851, Cl. 427-386.000.

Sano, Taketora: *See*—
Tujimoto, Hiroaki; Maki, Tatuya; Suganuma, Sadao; and Sano, Taketora, 4,049,556, Cl. 252-3.000.

Santing, Gerhardus: *See*—
Middelhoek, Servaas; Santing, Gerhardus; and Dost, Nicolaas, 4,049,425, Cl. 75-135.000.

Sanymetal Products Co., Inc., The: *See*—
Dielman, Harold J., 4,048,775, Cl. 52-239.000.

SAPAL Societe Anonyme des Plieuses Automatiques: *See*—
Chenevard, Alexis, 4,048,780, Cl. 53-26.000.

Sarasohn, Neil L., to Gentran Inc. Pressure gauge. 4,048,948, Cl. 116-114.0PV.

Sarvela, Jussi: *See*—
Hatakka, Vesa; and Sarvela, Jussi, 4,049,143, Cl. 214-390.000.

Sasaki, Takehiko, to Sharp Kabushiki Kaisha. Touch sensitive electrodes formed on the frame of an electronic wristwatch. 4,048,796, Cl. 58-23.00R.

Sasaki, Tohru: *See*—
Yoshikawa, Shinsuke; Sasaki, Tohru; and Terasaki, Syuuzi, 4,049,859, Cl. 428-172.000.

Sasaki, Yutaka; Morii, Akimitsu; Nakamura, Yoshimi; Moriya, Kiyoshi; and Utsumi, Hiroshi, to Nitto Chemical Industry Co., Ltd. Process of producing antimony-containing oxide catalysts. 4,049,575, Cl. 252-439.000.

Sasse, Howard A., to H. Sass-E International Inc. Exercise device. 4,048,985, Cl. 128-2.00S.

Sato, Hiroshi; Okumura, Munehiro; Itani, Fujio; Fujii, Shouji; Kakuda, Tsutomu; and Nakatui, Hiroshi, to Mitsubishi Rayon Co., Ltd. Inorganic substance composition and process for producing same. 4,049,593, Cl. 260-2.50E.

Sato, Kazunori: *See*—
Takada, Shunsuke; and Sato, Kazunori, 4,049,772, Cl. 423-54.000.

Sato, Kuniaki, to Kajima Corporation. Steel column base member. 4,048,776, Cl. 52-297.000.

Sato, Takao: *See*—
Bell, Richard; Sato, Takao; and Lahiri, Chitta Ranjan, 4,048,865, Cl. 74-231.00R.

Sato, Yoshinari: *See*—
Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,049,664, Cl. 260-294.80C.

Sato, Yuuichi: *See*—
Hashimoto, Shitaro; and Sato, Yuuichi, 4,050,064, Cl. 340-324.00M.

Satoh, Ryosuke: *See*—
Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Kato, Katsunori, 4,049,455, Cl. 96-76.00R.

Sauer, Gunter: *See*—
Reichelt, Walter; and Sauer, Gunter, 4,050,052, Cl. 338-308.000.

Sauer, Winfriede: *See*—
Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, 4,049,811, Cl. 424-258.000.

Saunders, Alexander M.: *See*—
Burns, Donald A.; Brand, Michael J.; and Saunders, Alexander M., 4,049,381, Cl. 23-230.00R.

Saunders, Proxy G.; and Moorman, Lorine. Hair-weaving device. 4,049,006, Cl. 132-5.000.

Savage, Donald D., to Powell, B. J. Modular vehicle subassembly. 4,049,072, Cl. 180-64.00M.

Savec: *See*—
Giraud, Francois Louis, 4,048,923, Cl. 104-21.000.

Sawaoka, Akira: *See*—
Tominaga, Hiroshi; Yasunami, Kazuo; Saito, Shinroku; Takamatsu, Masanobu; and Sawaoka, Akira, 4,049,367, Cl. 425-77.000.

Scardiglia, Frank; and Kiss, Kornel Dezso, to Dart Industries Inc. Extraction resistant polyolefin stabilizers. 4,049,751, Cl. 260-876.00R.

Scarffe, Michael, to Camber International (England) Limited. Needle selection mechanism. 4,048,816, Cl. 66-50.00R.

Schacht, Erich; Mehrhof, Werner; Wild, Albrecht; Gante, Joachim; and Kurmeier, Hans-Adolf, to Merck Patent Gesellschaft mit beschrankter Haftung. Phenylbutanol derivatives and compositions containing them. 4,049,823, Cl. 424-308.000.

Schaefer, E. Lowell. Tissue pulsator operating with a tapping action, and method. 4,048,989, Cl. 128-55.000.

Schaffer, Silvian: *See*—
Knorpp, Eberhard; and Schaffer, Silvian, 4,049,908, Cl. 178-58.00R.

Schawartz, Jozsef; Hornyak, Maria; Majorszki, Eva; David, Agoston; and Horvath, Gabor, to Kovacsovics, Erzsebet; and Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. 5-Amido imido triazene triazoles and pyrazoles with photographic and antimycotic utility. 4,049,639, Cl. 260-140.000.

Scheinberg, Israel Herbert. Preparation of ferrous hemoglobin and enzymatic digestion products thereof active for absorption of carbon monoxide. 4,049,673, Cl. 260-314.000.

Scheinpflug, Hans: *See*—
Paulus, Wilfried; Scheinpflug, Hans; and Genth, Hermann, 4,049,807, Cl. 424-246.000.

Scheitlin, George Edward; and Little, Richard Frederick, to Arvin Industries, Inc. Center air manifold for catalytic converter. 4,049,388, Cl. 23-288.0FB.

Schenk, Gerd; and Haake, Heinz, to Varta Batterie Aktiengesellschaft. Gas- and liquid-tight storage battery. 4,049,883, Cl. 429-94.000.

Schenk, Peter, to Dzus Fastener Co., Inc. Toggle latch. 4,049,301, Cl. 292-113.000.

Scherillo, Michele: *See*—
Cerra, Raffaele; and Scherillo, Michele, 4,050,026, Cl. 328-167.000.

Schering Aktiengesellschaft: *See*—
Laurent, Henry; Annen, Klaus; Wiechert, Rudolf; and Hofmeister, Helmut, 4,049,804, Cl. 424-242.000.

Schering Corporation: *See*—
Cooper, David J.; Waitz, Jay Allan; Counelis, Mae; and Weinstein, Jay, 4,049,796, Cl. 424-180.000.
Weinstein, Marvin Joseph; Daniels, Peter John Lovell; Wagman, Gerald Howard; and Testa, Raymond Thomas, 4,049,498, Cl. 195-96.000.

Schick, Ludwig: *See*—
Glaser, Helmut; and Schick, Ludwig, 4,050,008, Cl. 323-19.000.

Schiecke, Konrad L., to Zenith Radio Corporation. Static/purity device for in-line gun. 4,050,041, Cl. 335-210.000.

Schilling, Curtis Louis, Jr., to Union Carbide Corporation. Sulfolanyloxyalkyl cyclic polysiloxanes. 4,049,676, Cl. 260-332.100.

Schimke, Lloyd J. Liquid dispensing apparatus. 4,049,144, Cl. 222-448.000.

Schimmel, Karl F.; and Wismer, Marco, to PPG Industries, Inc. Polymer prepared from hydrazine and tricarboxylic acid derivatives and method of preparation. 4,049,637, Cl. 260-78.0TF.

Schirm, Volker: *See*—
Lechner, Manfred; Schirm, Volker; and Dettmann, Heinrich, 4,048,826, Cl. 72-21.000.

Schirmann, Jean-Pierre; and Weiss, Francis, to Produits Chimiques Ugine Kuhlmann. Method for manufacturing hydrazodicarbonamide. 4,049,712, Cl. 260-554.000.

Schlaff, Norman; and Maltese, Mario, to Norcon Electronics Inc. Talk-through unit with voice controlled switching with turn off delay variable from 250–500 milliseconds depending on voice amplitude. 4,049,911, Cl. 179-1.00H.

Schlapp, Wilhelm. Storage facility. 4,049,330, Cl. 312-186.000.

Schlussler, Henry, to United States of America, Army. Transponder based landing system. 4,050,069, Cl. 343-6.50R.

Schmidt, Hans, to Matsushita Electric Company of America. Planetary turret indicator. 4,048,949, Cl. 116-124.300.

Schmidt, Hans: *See*—
Nakanishi, Mutsuo; and Schmidt, Hans, 4,050,050, Cl. 338-190.000.

Schmidt, Horst, to KHD Industrieanlagen Ag. Impact hammer mill. 4,049,202, Cl. 241-30.000.

Schmidt, Peter: *See*—
Bianchi, Valerio; Latsch, Reinhard; and Schmidt, Peter, 4,048,965, Cl. 123-32.0EA.

Schmidt, Walter, to Prolizenz AG. Crucible. 4,049,250, Cl. 266-275.000.

Schmitt, Charles R.: *See*—
Googin, John M.; Schmitt, Charles R.; Schreyer, James M.; and Whitehead, Harlan D., 4,048,980, Cl. 126-270.000.
Schmitz, H. Gunter, to Supfina Maschinenfabrik Hentzen KG. Method for micro-finish machining of compound, circular arc-shaped profiled surfaces in annular workpieces. 4,048,764, Cl. 51-291.000.
Schneider, Alan A., to Catalyst Research Corporation. Lithium-iodine cells and method for making same. 4,049,890, Cl. 429-181.000.
Schneider, Daniel J. Fluid driven power producing apparatus. 4,049,300, Cl. 290-54.000.
Schoen, Ernst: *See*—
Falkenstein, Georg; Stein, Dieter; Haaf, Franz; Heinz, Gerhard; and Schoen, Ernst, 4,049,590, Cl. 260-2.5BE.
Schoenbachler, Bernard W.: *See*—
Durbin, Charles R.; and Schoenbachler, Bernard W., 4,048,834, Cl. 72-294.000.
Schoenlein, William J.: *See*—
Peterson, Glenn E.; Emerson, Robert T.; and Schoenlein, William J., 4,048,952, Cl. 118-6.000.
Scholz, Adolf: *See*—
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Schopen, Joseph L.: *See*—
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Schrader, William L.; and Rose, Harold T., to United States of America, Army. Freight container unloading system. 4,049,131, Cl. 214-14.000.
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Schroter, Herbert: *See*—
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Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See*—
Husges, Gerd, 4,049,215, Cl. 242-125.100.
Schull, George R. Key actuated electronic lock for auto ignitions. 4,050,063, Cl. 340-274.00C.
Schultz, Thomas W., to GTE Sylvania Incorporated. Exposure area control for an optical scanning system for manufacturing cathode ray tubes. 4,050,081, Cl. 354-1.000.
Schulz, Hansrichard, to Canon Kabushiki Kaisha. Focusing arrangement. 4,049,960, Cl. 250-201.000.
Schulz, Willis Lorenz: *See*—
Polomski, John; Schulz, Willis Lorenz; and Specht, Victor Joseph, 4,049,094, Cl. 192-3.310.
Schulze, Jurgen: *See*—
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.
Perrey, Hermann; Schulze, Jurgen; Rosenkranz, Hans Jurgen; Rudolph, Hans; and Hornle, Reinhold, 4,049,378, Cl. 8-87.000.
Schumann, Jochen: *See*—
Grof, Helmut Theodor; Schumann, Jochen; Wamser, Anton; Schumann, Rainer; and Thomas, Werner Friedrich, 4,049,039, Cl. 164-52.000.
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Weigel, Horst; and Spitz, Anton, deceased, 4,049,445, Cl. 75-82.000.
Schuster, Karl Ernst; Rosenkranz, Hans Jurgen; and Rudolph, Hans, to Bayer Aktiengesellschaft. Highly reactive sulphur-containing coating agents hardening under UV-light. 4,049,745, Cl. 260-837.00R.
Schutten, Herman P.: *See*—
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,050,083, Cl. 357-28.000.
Schutze, Eberhard: *See*—
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Schwab, Hermann; and Blum, Adolf, to BASF Aktiengesellschaft. Dyeing and printing of cellulosic fibers or mixtures of cellulosic fibers with synthetic fibers. 4,049,377, Cl. 8-169.000.
Schweiso, Robert J., to Raychem Corporation. Metal expansion plug. 4,049,151, Cl. 220-201.000.
Schwing, Gregory Wayne, to Du Pont de Nemours, E. I., and Company. 2-Alkyl-1-naphthol-4-sulfonic acids. 4,049,705, Cl. 260-512.00C.
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Tadmor, Zehev; and Klein, Imrich, 4,049,245, Cl. 259-191.000.
Scott, Kenneth W.; and Calderon, Nissim, to Goodyear Tire & Rubber Company, The. Preparation of graft, block and crosslinked unsaturated polymers and copolymers by olefin metathesis. 4,049,616, Cl. 260-42.320.
Seal, Michael R., to Board of Trustees Western Washington State College. Automotive vehicle. 4,049,309, Cl. 296-1.00S.
Seese, Ray Bruce: *See*—
Kubus, James Michael; Seese, Ray Bruce; and Watson, Bela Lee, 4,048,757, Cl. 51-436.000.
Segers, Jacobus Cornelis: *See*—
Ringers, Hendrik Johan; and Segers, Jacobus Cornelis, 4,049,686, Cl. 260-424.000.
Seifert, Hans; Will, Kurt; and Zapf, Horst, to Maschinenfabrik Augsburg-Nurnberg AG. Externally ignited four cycle gas engine. 4,048,974, Cl. 123-191.00M.
Seiger, Harvey N., to Yardney Electric Corporation. Active material for pressed nickel electrodes. 4,049,027, Cl. 141-1.100.
Seiler, Claus-Dieter; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Method of preparing β-chloroethyltrichlorosilane. 4,049,690, Cl. 260-448.20E.
Seiler, Herbert; and Dussy, Paul, to Ciba-Geigy AG. Water-insoluble anthraquinone dyestuffs containing a halodiazinyl group which are soluble in aprotic solvents. 4,049,661, Cl. 260-256.40N.
Seipp, William H., to Gulf & Western Industries, Inc. Self-addressing modules for programmable controller. 4,050,098, Cl. 364-900.000.
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Sejournet, Jerome. Liquid level gauge particularly for motorcycle. 4,048,855, Cl. 73-299.000.
Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See*—
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Seko, Maomi; Miyake, Tetsuya; Inada, Kohji; Ochi, Kazushi; and Sakamoto, Tomio, to Asahi Kasei Kogyo Kabushiki Kaisha. Separation of uranium isotopes by accelerated isotope exchange reactions. 4,049,769, Cl. 423-7.000.
SELENIA-Industrie Elettroniche Associate S.p.A.: *See*—
Buiatti, Marina, 4,048,712, Cl. 29-571.000.
Seris, Jean-Louis: *See*—
Gellato, Michel; Seris, Jean-Louis; and Suberloco, Jeannine, 4,049,516, Cl. 204-158.0HA.
Sessler, John A. Automatic transmission. 4,049,103, Cl. 192-105.0CD.
Sevenich, Theodor: *See*—
Fabian, Wolfgang; Klein, Konrad; and Sevenich, Theodor, 4,048,831, Cl. 72-251.000.
Shaffer, John W., to GTE Sylvania Incorporated. Photoflash lamp and multilamp unit with electrostatic protection. 4,049,369, Cl. 431-95.00R.
Shanahan, Francis V.; and Feller, Herman H., to Stick-M-All, Inc. Baseboard trap for crawling insects. 4,048,747, Cl. 43-114.000.
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Hashimoto, Shitaro; and Sato, Yuuichi, 4,050,064, Cl. 340-324.00M.
Ito, Tadashi; Wakahara, Katuhiro; and Tatsuoka, Masao, 4,048,811, Cl. 62-263.000.
Sasaki, Takehiko, 4,048,796, Cl. 58-23.00R.
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.
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Dominguez, Richard J. G., 4,049,595, Cl. 260-5.000.
Middelhoek, Servaas; Santing, Gerhardus; and Dost, Nicolaas, 4,049,425, Cl. 75-135.000.
Roman, Steven A., 4,049,652, Cl. 544-54.000.
Shen, Kelvin Kei-Wei; and Belles, Wayne Stuart, to United States Borax & Chemical Corporation. Herbicidal morpholinobenzimidazoles. 4,049,422, Cl. 71-92.000.
Sheng, Ming N.; and Mameniskis, Walter A., to Atlantic Richfield Company. Osmium catalyzed organic hydroperoxide hydroxylation of olefinic compounds. 4,049,724, Cl. 260-635.00H.
Shenk, William. Sewage system. 4,049,013, Cl. 137-263.000.
Shepard Niles Crane & Hoist Corporation: *See*—
Rundle, Frederick Stanley, 4,049,089, Cl. 188-171.000.
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Shesterikov, Stanislav Alexeevich: *See*—
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Shieu, Mark S. D.; Johnson, Robert B.; and Laugesen, Ronald C., to National Semiconductor Corporation. Multi-bootstrap driver circuit. 4,049,979, Cl. 307-270.000.
Shigematsu, Taichiro; Shibahara, Tetsuya; Nakazawa, Makoto; Tomida, Masayuki; and Munakata, Toshio, to Mitsubishi Chemical

Industries Limited. Substituted urazole and thiourazole compounds as agricultural fungicidal agents. 4,049,820, Cl. 424-273.00P.
Shimadzu Seisakusho Ltd.: *See—*
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Shimizu, Akira: *See—*
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Shimizu, Hiroshi; Nishidai, Jun; and Yasuta, Toru, to Nippon Electric Glass Company, Limited. Apparatus for uniformly heating molten glass. 4,049,899, Cl. 13-6.000.
Shiokawa, Shigeru: *See—*
Ko, Keiun; Takashina, Naomitsu; Shiokawa, Shigeru; and Fujita, Rokuro, 4,049,634, Cl. 260-75.0UA.
Shipp, Barry E.: *See—*
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Zaplatin, Veniamin Petrovich; Svitelsky, Vasily Petrovich; Galov, Lev Ivanovich; Djukareva, Alla Konstantinovna; Sklyar, Rozalia Grigorievna; Denisovich, Vasily Alexeevich; Shirokov, Dmitry Alexeevich; and Shevchenko, Vladimir Alexandrovich, 4,049,490, Cl. 162-37.000.
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Shoji, Jinichi: *See—*
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Yamaguchi, Toshiaki; and Shoji, Jinichi, 4,049,214, Cl. 242-75.510.
Shriver, Joe E.; and Norman, Donald O., to Sperry Rand Corporation. Row crop means for a harvesting unit. 4,048,792, Cl. 56-98.000.
Shrum, Sidney J., to Chevron Research Company. Removable anchor having retrievable ballast. 4,048,945, Cl. 114-294.000.
Shterenberg, Ljudmila Efimovna: *See—*
Vereschagin, Leonid Fedorovich; Yakovlev, Evgeny Nikolaevich; Varfolomeeva, Tatyana Dmitrievna; Preobrazhensky, Alexandr Yakovlevich; Slesarev, Vladislav Nikolaevich; Stepanov, Vasily Alexandrovich; and Shterenberg, Ljudmila Efimovna, 4,049,783, Cl. 423-446.000.
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Siden, Dennis C., to Raychem Corporation. Wire preparation and termination means and method. 4,049,334, Cl. 339-97.00R.
Siebert, Werner: *See—*
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Sieder, Theodore P.: *See—*
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Siemens Aktiengesellschaft: *See—*
Berger, Helmut; Holzermer, Gunther; Kirsch, Harry; and Vijlbrief, Pieter, 4,049,967, Cl. 250-445.00T.
Distler, Walter; Zink, Roderich; and Linke, Gerhard, 4,049,968, Cl. 250-445.00T.
Fink, Helmuth; and Wess, Guenter, 4,050,014, Cl. 324-57.00H.
Glaser, Helmut; and Schick, Ludwig, 4,050,008, Cl. 323-19.000.
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Politycki, Alfred; and Hieber, Konrad, 4,048,954, Cl. 118-49.100.
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Sigl, Wayne C.; and Lassen, Frederick O., to Kimberly-Clark Corporation. Method of forming highly absorbent filaments and webs having improved softness, wicking, and solvent drying characteristics. 4,049,764, Cl. 264-178.00F.
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Gray, Paul R.; and Stephens, Mark L., 4,050,031, Cl. 330-24.000.
Youmans, Albert P., 4,050,049, Cl. 338-47.000.
Signode Corporation: *See—*
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Siker, Stephen J. Method of installing decals on vertically ribbed trailer bodies. 4,049,479, Cl. 156-71.000.
Silbernagel, Bernard G.: *See—*
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Simmons, Robert Sidney, to Casaire Limited. Air conditioning. 4,048,809, Cl. 62-89.000.
Simokat, Frank L., to TII Corporation. Multi-circuit protector. 4,050,092, Cl. 361-56.000.
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Simpson, George R.; Gundlach, Robert W.; and Butler, Gordon C., to Xerox Corporation. Electrostatic imaging system. 4,049,344, Cl. 355-10.000.
Simrad A.S.: *See—*
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Sims, Louis Ray: *See—*
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Singer Company, The: *See—*
Odermann, Charles R.; Peterson, Wesley R.; Herr, John A.; and Porter, Oswald M., 4,048.932, Cl. 112-158.00E.
Singleton, Anthony, to Kontak Manufacturing Company Limited. Detents for locking movable elements. 4,049,235, Cl. 251-297.000.
Sinkula, Anthony A., to Upjohn Company, The. Ibuprofen p-hydroxybenzaldehyde semicarbazone ester. 4,049,699, Cl. 560-105.000.
Sinkula, Anthony A., to Upjohn Company, The. Ibuprofen p-hydroxyphenylurea ester. 4,049,700, Cl. 560-105.000.
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Siozaki, Fumio: *See—*
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Skelton, Carl W. Board game apparatus. 4,049,275, Cl. 273-134.0AE.
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van de Kooi, Johannes Maria, 4,049,012, Cl. 137-3.000.
Skibowski, Hubert. Shut-off and regulator device for controllable mechanisms intended for installation in pipelines. 4,049,018, Cl. 137-561.00R.
Sklyar, Rozalia Grigorievna: *See—*
Zaplatin, Veniamin Petrovich; Svitelsky, Vasily Petrovich; Galov, Lev Ivanovich; Djukareva, Alla Konstantinovna; Sklyar, Rozalia Grigorievna; Denisovich, Vasily Alexeevich; Shirokov, Dmitry Alexeevich; and Shevchenko, Vladimir Alexandrovich, 4,049,490, Cl. 162-37.000.
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Sloboda, Mieczyslaw Herman; and Hatswell, John Sidney, to Johnson, Matthey & Co., Limited. Brazing alloy. 4,049,434, Cl. 75-134.00C.
Slocum, Robert E., to Texas Instruments Incorporated. Light polarizing material method and apparatus. 4,049,338, Cl. 350-152.000.
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Smith, Arthur: *See—*
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Smith, Gary W.; Leavens, Dwight E.; and Sims, Louis Ray, to Sylvachem Corporation. Process for cleansing spent clay. 4,049,685, Cl. 260-412.500.
Smith, Hubert Stacy, Jr.; and Hay, Robert A., II, to Dow Chemical

Company, The. Laminate preparation and application thereof. 4,049,852, Cl. 428-55.000.
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Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,049,672, Cl. 548-342.000.
Smith, Pattie. Bed pan. 4,048,682, Cl. 5-91.000.
Smith, Peter David; and Smith, Keith Hindle, to Detectronic Limited. Method and apparatus for monitoring the flow of liquid and the like. 4,048,853, Cl. 73-194.00A.
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Smith, Stanley, to Rolls-Royce (1971) Limited. Apparatus for separating suspensions of liquids in gas. 4,049,401, Cl. 55-184.000.
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Lam, Bing Lun; Lewis, Joseph James; Webb, Robert Lee; and Wellman, George Robert, 4,049,669, Cl. 260-306.80R.
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Sobol, Jacob M. Nebulizer. 4,049,200, Cl. 239-338.000.
Societe Anonyme de Telecommunications: *See—*
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Societe Anonyme des Hauts Fourneaux de la Chiers: *See—*
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Societe Anonyme dite: Etablissements Genoud & Cie: *See—*
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Societe anonyme dite: Laboratoire L. Lafon: *See—*
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Societe Anonyme Francaise du Ferodo: *See—*
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Societe Chimique des Charbonnages: *See—*
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Societe d'Applications Generales d'Electricite et de Mecanique SAGEM: *See—*
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Societe Franco-Europeenne de Material pour l'Industrie Alimentaire "F.E.M.I.A" France: *See—*
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Societe Nationale Elf Aquitaine: *See—*
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Solvay & Cie.: *See—*
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Garvin, Hugh L.; Yariv, Amnon; and Somekh, Sasson, 4,049,944, Cl. 219-121.0EM.
Sony Corporation: *See—*
Ishii, Hirohisa; and Shishikura, Masami, 4,049,984, Cl. 310-42.000.
Kishi, Yoshio, 4,050,087, Cl. 360-96.000.
Ohsawa, Misuo, 4,049,918, Cl. 179-15.0BT.
Okuda, Hiroshi, 4,050,088, Cl. 360-96.000.
Tamura, Michio, 4,048,951, Cl. 118-6.000.
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Fujita, Tadao, 4,049,507, Cl. 204-39.000.
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Enomoto, Masahisa, 4,049,530, Cl. 204-273.000.
Souslin, Richard Ervin, to Boeing Company, The. Variable orifice hydraulic snubber. 4,048,905, Cl. 91-405.000.
Soyland, Ingebret. Excavator having lifting legs and cooperating boom mounted bucket for "walking". 4,049,070, Cl. 180-8.00C.
Soyland, Ingebret. Excavator having adjustable wheels. 4,049,138, Cl. 214-132.000.
Spangler, Glen C. Trash sack support. 4,048,691, Cl. 15-257.100.
Spannlang, Ronald: *See—*
Moser, Peter; Eysn, Manfred; Enkner, Bernhard; Berger, Rupert; Wagner, Wolfgang; and Spannlang, Ronald, 4,049,249, Cl. 266-247.000.
Sparks, Virgil H., Sr. Oil well pump with plunger pull down and desanding assembly. 4,049,365, Cl. 417-554.000.
Specht, Victor Joseph: *See—*
Polomski, John; Schulz, Willis Lorenz; and Specht, Victor Joseph, 4,049,094, Cl. 192-3.310.
Special Metals Corporation: *See—*
Burton, Claudia J., 4,049,470, Cl. 148-3.000.
SpectraMetrics, Incorporated: *See—*
Missio, Danilo V., 4,049,353, Cl. 356-85.000.
Spellman, Gordon B.: *See—*
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,050,083, Cl. 357-28.000.
Spencer, Clark V.; and Rondeau, Benjamin G. Choker straightener. 4,048,837, Cl. 72-387.000.
Speranza, George P.: *See—*
McEntire, Edward E.; and Speranza, George P., 4,049,591, Cl. 260-2.5AC.
Sperry Rand Corporation: *See—*
Hurlburt, Joseph C.; Brown, Howard R.; and Buck, Ernest E., 4,048,862, Cl. 74-57.000.
Johnson, Gary L.; and Zoya, Walter J., 4,049,014, Cl. 137-315.000.
Shriver, Joe E.; and Norman, Donald O., 4,048,792, Cl. 56-98.000.
Spescha, Gelli, to Rieter Machine Works, Ltd. Winding apparatus for textile threads. 4,049,211, Cl. 242-45.000.
Spindler, Kurt: *See—*
Raab, Richard; Spindler, Kurt; Brand, Herbert; and Gast, Leonard, 4,048,832, Cl. 72-255.000.
Spisak, John A., to Pipe Line Development Co., The. Safety cock. 4,049,234, Cl. 251-149.900.
Spitz, Anton, deceased: *See—*
Weigel, Horst; and Spitz, Anton, deceased, 4,049,445, Cl. 75-82.000.
Spivack, John D., to Ciba-Geigy Corporation. 2,3,5-Trialkylsubstituted hydroxybenzyl isocyanurates. 4,049,654, Cl. 544-221.000.
Spivack, John D., to Ciba-Geigy Corporation. Esters and amides of trisubstituted hydroxyphenylalkanoic acids. 4,049,713, Cl. 260-559.00R.
Spoor, Herbert: *See—*
Eisentraeger, Klaus; Immel, Guenther; Marx, Matthias; Reinhard, Hans; Spoor, Herbert; and Storck, Gerhard, 4,049,847, Cl. 427-207.00B.
Spranger, Douglas M.: *See—*
Brookes, Malcolm J.; Sheridan, James A.; and Spranger, Douglas M., 4,049,283. Cl. 280-47.13R.
Sridhar, Ramamritham: *See—*
Bell, Malcolm Charles Evert; and Sridhar, Ramamritham, 4,049,444, Cl. 75-82.000.
Sridhar, Ramamrithan; Warner, John Stuart; and Bell, Malcolm Charles Evert, to International Nickel Company, Inc., The. Non-ferrous metal recovery from deep sea nodules. 4,049,438, Cl. 75-21.000.
Sta-Tite Corporation: *See—*
Maranell, Melvin C., 4,049,905, Cl. 174-163.00F.
Stach, Kurt: *See—*
Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, 4,049,811, Cl. 424-258.000.
Stagg, Geoffrey Brian Kenneth: *See—*
Williams, John Lloyd; Leaman, Roger John; Moberly, Robert Valentine; Stagg, Geoffrey Brian Kenneth; and Wisdom, Graham John, 4,050,059, Cl. 364-200.000.
Stahler, Fritz: *See—*
Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 4,049,702, Cl. 260-501.120.
Stal Refrigeration AB: *See—*
Brandin, Johan A. I., 4,049,233, Cl. 251-61.100.
Stamer, Walter; and Eichinger, Frithjof, to Claudius Peters AG; and MAXPETERS Gesellschaft fur Verfahrenstechnik mbH. Equipment for the continuous pneumatic introduction of coal dust. 4,049,247, Cl. 266-182.000.
Standard Brands Incorporated: *See—*
Gannis, Peter Michael; and Bosco, Peter Michael, 4,049,833, Cl. 426-93.000.
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., to Xerox Corporation. Apparatus for feeding documents to and from a copier. 4,049,255, Cl. 271-3.000.
Staudinger, Gernot, to Shell Internationale Research Maatschappij B.V. Process and apparatus for the supply of a dry, free-flowing coal powder to a high-pressure coal gasification reactor. 4,049,133, Cl. 214-17.00B.
Stauffer Chemical Company: *See—*
Baker, Don R.; and Walker, Francis H., 4,049,423, Cl. 71-118.000.
Baker, Don R.; and Walker, Francis H., 4,049,424, Cl. 71-118.000.
Jin, Jung Il; and Kraft, Paul, 4,049,747, Cl. 260-859.0PV.
Large, George B., 4,049,826, Cl. 424-326.000.
Weil, Edward D., 4,049,754, Cl. 260-952.000.
Stearley, Robert J., to Great Plains Bag Corporation. Block bottom valve bag. 4,049,191, Cl. 229-62.500.
Stebbins, George B.; and Stebbins, James F. Water polishing means for removing oil and other flotsam from water. 4,049,553, Cl. 210-195.00R.
Stebbins, James F.: *See—*
Stebbins, George B.; and Stebbins, James F., 4,049,553, Cl. 210-195.00R.
Steblyak, Vladimir Demyanovich: *See—*
Lotosh, Valery Efimovich; and Steblyak, Vladimir Demyanovich, 4,049,435, Cl. 75-3.000.
Steckler, Robert; Robinson, Fred; and Farmer, Robert F., III, to Alcolac Inc. Functional monomers and copolymers thereof. 4,049,608, Cl. 260-29.6SQ.
Stedman, Robert N., to Caterpillar Tractor Co. Modular dual wheel suspension and drive arrangement for trucks. 4,049,071, Cl. 180-24.050.
Stedman, Robert N., to Caterpillar Tractor Co. Tractor mounted apparatus for performing aerial work tasks. 4,049,079, Cl. 182-2.000.
Stedman, Robert N., to Caterpillar Tractor Co. Backhoe with multi-movement capabilities. 4,049,139, Cl. 214-138.00R.

Steele, James E. Mobile corral. 4,048,959, Cl. 119-20.000.

Stein, Dieter: *See—*
Falkenstein, Georg; Stein, Dieter; Haaf, Franz; Heinz, Gerhard; and Schoen, Ernst, 4,049,590, Cl. 260-2.5BE.

Stemmler, Kurt: *See—*
Ehlscheid, Gunter; Langenbeck, Peter; and Stemmler, Kurt, 4,049,945, Cl. 219-121.0LM.

Stepanov, Vasily Alexandrovich: *See—*
Vereschagin, Leonid Fedorovich; Yakovlev, Evgeny Nikolaevich; Varfolomeeva, Tatyana Dmitrievna; Preobrazhensky, Alexandr Yakovlevich; Slesarev, Vladislav Nikolaevich; Stepanov, Vasily Alexandrovich; and Shterenberg, Ljudmila Efimovna, 4,049,783, Cl. 423-446.000.

Stephens-Adamson, Inc.: *See—*
Ouska, Ralph C.; and Bertaud, Francois X., 4,049,328, Cl. 308-187.100.

Stephens, Mark L.: *See—*
Gray, Paul R.; and Stephens, Mark L., 4,050,031, Cl. 330-24.000.

Sterbenz, Francis J.: *See—*
Cotty, Val F.; Sterbenz, Francis J.; and Melman, Kenneth J., 4,049,803, Cl. 424-233.000.

Sterling Drug Inc.: *See—*
Bell, Malcolm R., 4,049,715, Cl. 260-571.000.

Sternbach, Leo Henryk: *See—*
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,049,666, Cl. 260-294.80R.
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,049,667, Cl. 260-294.80R.

Stevens, Dale: *See—*
Stevens, Henry H., 4,048,873, Cl. 81-3.00R.

Stevens, Doyle: *See—*
Stevens, Henry H., 4,048,873, Cl. 81-3.00R.

Stevens, Henry H., to Johnson, Tony; Johnson, Eloise; Stevens, Dale; Stevens, Doyle; Stevens, Tom; and Casady, Fern. Door security lock opening tool and method of using same. 4,048,873, Cl. 81-3.00R.

Stevens, Tom: *See—*
Stevens, Henry H., 4,048,873, Cl. 81-3.00R.

Stevenson, Paul D.: *See—*
Vukovich, William J.; and Stevenson, Paul D., 4,049,093, Cl. 192-3.300.

Stewart, Henry G.: *See—*
Castleman, Howard H.; and Stewart, Henry G., 4,048,736, Cl. 40-2.00R.

Stich, Frederick A., to Allis-Chalmers Corporation. Inverter having constant frequency chopper synchronized to modulation frequency. 4,050,006, Cl. 363-98.000.

Stick-M-All, Inc.: *See—*
Shanahan, Francis V.; and Feller, Herman H., 4,048,747, Cl. 43-114.000.

Stickl, Helmut. Preparations for local treatment of acne vulgaris. 4,049,793, Cl. 424-115.000.

Stier, Bernhard: *See—*
Flach, Hans-Georg; and Stier, Bernhard, 4,050,021, Cl. 324-150.000.

Stiles, Claude J.; and Tomo, Daniel, to National Distillers and Chemical Corporation. Plastic skin envelopes for glass bottles and the like. 4,049,147, Cl. 215-12.00R.

Still-Man Mfg. Company: *See—*
Gilreath, Robert V., 4,049,948, Cl. 219-404.000.

Stix, Nathan, to United States Shoe Corporation, The. Shoe and method of making the same. 4,048,732, Cl. 36-34.00B.

Stjarne, Anders Olov Gunnar; and Sander, Nils Borje Lennart, to Svenska Aktiebolaget Bromsregulator. Parking brake arrangement for a rail vehicle brake. 4,049,088, Cl. 188-107.000.

Stock, Gunter: *See—*
Wener, Kurt; Stock, Gunter; Herrig, Klaus; and Wagner, Heinz, 4,049,224, Cl. 245-6.000.

Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,049,662, Cl. 260-287.00D.

Stolz, Gerhard. Clothes-hanging clip. 4,049,163, Cl. 223-96.000.

Stonner, Hans-Martin: *See—*
Wohler, Fritz; Stonner, Hans-Martin; and Wiesner, Paul, 4,049,782, Cl. 423-352.000.

Storck, Gerhard: *See—*
Eisentraeger, Klaus; Immel, Guenther; Marx, Matthias; Reinhard, Hans; Spoor, Herbert; and Storck, Gerhard, 4,049,847, Cl. 427-207.00B.

Stork, Gilbert J.: *See—*
Untch, Karl G.; and Stork, Gilbert J., 4,049,697, Cl. 560-118.000.

Storm, Anders Georg, to Swedish Rail System AB SRS. Vehicle for and method of operation on both road and railroad track. 4,048,925, Cl. 105-215.00C.

Storm, Donald P.; Sammarco, Peter; Fritz, Edward A.; and Mackert, Robert J., to International Harvester Company. Forage harvester drive. 4,049,207, Cl. 241-101.700.

Stouls, Francois-Xavier: *See—*
Jolivet, Jean-Claude; and Stouls, Francois-Xavier, 4,049,910, Cl. 178-69.100.

Strade, Henry A., to Akzona Incorporated. Steroidal erythropoietic agents and therapeutic compositions and methods. 4,049,805, Cl. 424-243.000.

Straka, Daniel Charles, to ARCO Polymers, Inc. Latex frothing agent used in making an elastomeric latex foam. 4,049,587, Cl. 260-2.50L.

Straley, James M.: *See—*
Weaver, Max A.; Straley, James M.; and Moore, William H., 4,049,643, Cl. 260-207.100.

Straub, Otto-Christian, to Bayer Aktiengesellschaft. Treatment of infections in animals. 4,049,794, Cl. 424-167.000.

Strausburg, Larry D., to Monarch Marking Systems, Inc. Tag attacher. 4,049,178, Cl. 227-67.000.

Street, Henry K.: *See—*
Hoover, William R.; Mead, Keith E.; and Street, Henry K., 4,049,864, Cl. 428-332.000.

Strelitz, Robert A.: *See—*
Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,049,559, Cl. 252-8.55D.
Witzel, Bruce E.; Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,049,417, Cl. 71-67.000.

Striebel, Robert L., II: *See—*
Raghavachari, Srinivas T.; and Striebel, Robert L., II, 4,048,997, Cl. 128-215.000.

Strobel, Pierre: *See—*
Hatterer, Andre; Oberlin, Claude; and Strobel, Pierre, 4,049,443, Cl. 75-66.000.

Stroiwas, Edward: *See—*
Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., 4,049,736, Cl. 260-669.0QZ.

Stromback, Per, to Salen & Wicander Terminalsystem AB. Crane adapted to the handling of uniform cargo units. 4,049,132, Cl. 214-14.000.

Strycker, Stanley J., to Dow Chemical Company, The. Substituted phenoxyalkyl quaternary ammonium compounds as antiarrhythemic agents. 4,049,814, Cl. 424-267.000.

Stuckmann, Dieter; Babendererde, Siegmund; Jutte, Hans; and Bokemeyer, Reinhard, to Gewerkschaft Eisenhutte Westfalia; and Hochtief A.G. Apparatus for, and a method of, driving tunnels. 4,048,806, Cl. 61-85.000.

Studer, Martin, to Sandoz Ltd. Optionally substituted sulfophenyl-azo-naphthylene-azo-para-alkoxyphenyl dyes. 4,049,641, Cl. 260-191.000.

Stumpf, Irvin L.: *See—*
Meyer, Gustave, 4,049,137, Cl. 214-82.000.

Stumpp, Gerhard, to Robert Bosch GmbH. System for detoxicating exhaust gases. 4,048,967, Cl. 123-119.00A.

Suberloco, Jeannine: *See—*
Gellato, Michel; Seris, Jean-Louis; and Suberloco, Jeannine, 4,049,516, Cl. 204-158.0HA.

Such, Tony Eugene; Wyszynski, Apoloniusz; and James, Barrie Sydney, to W. Canning & Company Limited. Plating. 4,049,509, Cl. 204-49.000.

Suchla, Germane M.: *See—*
Lo, Vincent; Vos, Kenneth D.; and Suchla, Germane M., 4,049,158, Cl. 222-95.000.

Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft: *See—*
Freissmuth, Alfred; Heinl, Walter; Knahl, Herbert; and Pfluger, Erich, 4,049,442, Cl. 75-55.000.

Sudler, Roland, to VDO Adolf Schindling AG. Damping device for a stepper motor. 4,049,985, Cl. 310-49.00R.

Suga, Shigeru. Contact means for a weather resistance and solar radiation tester. 4,049,351, Cl. 356-72.000.

Suganuma, Sadao: *See—*
Tujimoto, Hiroaki; Maki, Tatuya; Suganuma, Sadao; and Sano, Taketora, 4,049,556, Cl. 252-3.000.

Suhr, Donald C.; and Hedgewick, Peter, to International Tools (1973) Ltd. Child resistant closure assembly. 4,049,148, Cl. 215-214.000.

Sukonnik, Izrail Moishevich: *See—*
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.

Sullivan, John L.; Knauber, Veronica A.; and Nelson, James E., to A-T-O Inc. Back frame. 4,049,164, Cl. 224-5.00W.

Sulzer Brothers Ltd.: *See—*
le Febve de Vivy, Dominique, 4,049,971, Cl. 290-40.00R.
Quack, Hans, 4,048,814, Cl. 62-335.000.

Sumida, Hiroyuki: *See—*
Sakakibara, Kaichi; and Sumida, Hiroyuki, 4,048,852, Cl. 73-193.00R.

Sumitomo Chemical Company, Limited: *See—*
Hosaka, Hirokazu; Tanimoto, Kenji; and Yamachika, Hiroshi, 4,049,720, Cl. 260-610.00B.
Inoue, Yasuhiko; and Uyeo, Keizo, 4,049,740, Cl. 260-671.00R.

Sumitomo Electric Industries, Ltd.: *See—*
Okita, Koichi; and Sakane, Isamu, 4,049,589, Cl. 260-2.50M.
Yamamoto, Takaharu; Nomura, Toshio; Asai, Tsuyoshi; and Hara, Akio, 4,049,876, Cl. 428-932.000.

Sumitomo, Yuji: *See—*
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.

Sun Chemical Corporation: *See—*
Silverman, Stanley; and Broeils, John, 4,048,916, Cl. 101-40.000.
Skrypek, John P.; and Peters, Arnold, 4,048,917, Cl. 101-40.000.

Sundermann, Rudolf; Putter, Rolf; and Grigat, Ernst, to Bayer Aktiengesellschaft. Process for preparation of s-triazine prepolymers. 4,049,630, Cl. 260-47.00R.

Suntech, Inc.: *See—*
Hansel, William B., 4,049,029, Cl. 141-206.000.

Supfina Maschinenfabrik Hentzen KG: *See—*
Schmitz, H. Gunter, 4,048,764, Cl. 51-291.000.
Suprenant, Paul J.: *See—*
Crocker, Thomas H.; Levitt, Barry N.; and Suprenant, Paul J., 4,050,062, Cl. 340-183.000.
Sutter, Jean Georges, to Pont-A-Mousson S.A. Motor-driven control device for a valve-actuating spindle. 4,050,000, Cl. 318-468.000.
Sutton, Leslie Joseph. Telephone hand-set holding means. 4,049,927, Cl. 179-150.000.
Suzuki, Kenji: *See—*
Hori, Yutaka; Honda, Zenzo; Suzuki, Kenji; Nakamoto, Keiji; and Yamamoto, Yoshiharu, 4,049,904, Cl. 174-107.000.
Suzuki, Yoshio. Escape device for a multi-storey building. 4,049,080, Cl. 182-48.000.
Svenska Aktiebolaget Bromsregulator: *See—*
Stjarne, Anders Olov Gunnar; and Sander, Nils Borje Lennart, 4,049,088, Cl. 188-107.000.
Svitelsky, Vasily Petrovich: *See—*
Zaplatin, Veniamin Petrovich; Svitelsky, Vasily Petrovich; Galov, Lev Ivanovich; Djukareva, Alla Konstantinovna; Sklyar, Rozalia Grigorievna; Denisovich, Vasily Alexeevich; Shirokov, Dmitry Alexeevich; and Shevchenko, Vladimir Alexandrovich, 4,049,490, Cl. 162-37.000.
Swan, Dale G.: *See—*
Peerman, Dwight E.; Swan, Dale G.; and Kanten, H. Gordon, 4,049,598, Cl. 260-18.00N.
Swedish Rail System AB SRS: *See—*
Storm, Anders Georg, 4,048,925, Cl. 105-215.00C.
Swenson, Roy S.: *See—*
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,049,491, Cl. 162-101.000.
Swinkels, Godefridus Maria; Furber, Robert Arthur; Milner, Edward Francis Godfrey; Genik-Sas-Berezowsky, Roman Michael; and Kirby, Charles Ray, to Sherritt Gordon Mines Limited; and Cominco Ltd. Recovery of copper and zinc as sulfides from copper-iron sulfides. 4,049,770, Cl. 423-37.000.
Swiss Aluminium Ltd.: *See—*
Alder, Hanspeter; and Boving, Hans, 4,049,511, Cl. 204-67.000.
Sylvachem Corporation: *See—*
Smith, Gary W.; Leavens, Dwight E.; and Sims, Louis Ray, 4,049,685, Cl. 260-412.500.
Syntex (U.S.A.) Inc.: *See—*
Beeby, Philip J., 4,049,806, Cl. 424-246.000.
Kracklauer, John J., 4,049,618, Cl. 260-45.75P.
Untch, Karl G.; and Stork, Gilbert J., 4,049,697, Cl. 560-118.000.
Systex, Inc.: *See—*
Nason, George F., III; and Winter, Walter W., 4,048,728, Cl. 35-8.00A.
Szova, Janos. Combination lock. 4,048,823, Cl. 70-306.000.
Szur, Alex J., to Diamond Shamrock Corporation. Cationic fluorochemical surfactants. 4,049,668, Cl. 260-295.00R.
Szymborski, Andrew M., to General Corrugated Machinery Co., Inc. Apparatus for feeding sheets. 4,049,260, Cl. 271-151.000.
Tadmor, Zehev; and Klein, Imrich, to Scientific Process & Research, Inc. Apparatus and method for preparing a plasticated material. 4,049,245, Cl. 259-191.000.
Tagawa, Kazuaki, to Ricoh Company, Ltd. Magnetic brush developing apparatus for electrophotography. 4,048,957, Cl. 118-653.000.
Takada, Shunsuke; and Sato, Kazunori, to Tokico, Ltd. Process for the recovery of chromic acid solution from waste water containing chromate ions. 4,049,772, Cl. 423-54.000.
Takagi, Yasuo: *See—*
Mineo, Masatoshi; Oka, Ken-ichiro; Nakagawa, Kiyoshi; Matsuda, Hiyoshi; Ohno, Shigeo; and Takagi, Yasuo, 4,049,763, Cl. 264-176.00F.
Takahashi, Kenji: *See—*
Kawabata, Minoru; and Takahashi, Kenji, 4,048,904, Cl. 91-375.00A.
Takahashi, Masashi: *See—*
Kishi, Hajimu; and Takahashi, Masashi, 4,050,001, Cl. 318-625.000.
Takahashi, Mitsuo: *See—*
Nakamura, Kunio; and Takahashi, Mitsuo, 4,049,439, Cl. 75-24.000.
Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Semipermanently lockable slider. 4,048,698, Cl. 24-205.14R.
Takamatsu, Masanobu: *See—*
Tominaga, Hiroshi; Yasunami, Kazuo; Saito, Shinroku; Takamatsu, Masanobu; and Sawaoka, Akira, 4,049,367, Cl. 425-77.000.
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, to Nippon Telegraph and Telephone Public Corporation; and Sharp Kabushiki Kaisha. Deflection means including a deflection electrode mounted on a travelling carriage in an ink jet system printer. 4,050,076, Cl. 346-75.000.
Takao, Hiroshi: *See—*
Togawa, Kimmochi; Takao, Hiroshi; Matoba, Kazuo; and Kishida, Katsuhiro, 4,049,524, Cl. 204-195.00S.
Takashina, Naomitsu: *See—*
Ko, Keiun; Takashina, Naomitsu; Shiokawa, Shigeru; and Fujita, Rokuro, 4,049,634, Cl. 260-75.0UA.
Takeda Chemical Industries, Ltd.: *See—*
Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, 4,049,812, Cl. 424-263.000.
Takeuchi, Tomio: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,049,497, Cl. 195-80.00R.
Taki, Tsuneo: *See—*
Honda, Fumio; Taki, Tsuneo; and Kajiwara, Masatoshi, 4,049,118, Cl. 206-330.000.
Takimoto, Masaaki: *See—*
Honjo, Satoru; and Takimoto, Masaaki, 4,049,448, Cl. 96-1.50R.
Tamai, Yasuo: *See—*
Ogawa, Hiroshi; Tamai, Yasuo; and Nishina, Tutomu, 4,049,871, Cl. 428-425.000.
Tamamura, Ryozo; and Yamanaka, Masami, to Yamato Scale Company, Limited. Device for weighing running vehicle. 4,049,069, Cl. 177-134.000.
Tamao, Yoshikuni: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,049,645, Cl. 260-239.00B.
Tamura, Chihiro: *See—*
Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, 4,049,495, Cl. 195-36.00R.
Tamura, Michio, to Sony Corporation. Apparatus for applying a glass frit to a seal edge of a funnel portion of a picture tube. 4,048,951, Cl. 118-6.000.
Tan, Swie-In: *See—*
Ainslie, Norman George; Hempstead, Robert Douglas; Tan, Swie-In; and Valstyn, Erich Philipp, 4,049,522, Cl. 204-192.00M.
Tanabe, Osamu; Nishizawa, Hisao; and Hata, Kazuo, to Dainippon Screen Seizo Kabushiki-Kaisha. Apparatus for exposing a photosensitive beltlike material. 4,049,345, Cl. 355-41.000.
Tanaka, Eiji: *See—*
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Fujita, Tadao, 4,049,507, Cl. 204-39.000.
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Enomoto, Masahisa, 4,049,530, Cl. 204-273.000.
Tanaka, Seiichi; Watari, Kazuhiro; and Hayashi, Hideki, to Mitsui Petrochemical Industries, Ltd. Method for separation and recovering hydroquinone. 4,049,723, Cl. 260-621.00A.
Tanaka, Tsunemitsu: *See—*
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.
Tanemoto, Toshiharu: *See—*
Nakagawa, Tetsuo; Matsuda, Nobuo; Mitani, Kazumitsu; and Tanemoto, Toshiharu, 4,049,541, Cl. 208-127.000.
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.
Taniguchi, Toru, to Reica Kogyo Kabushiki Kaisha. Motionless mixing device. 4,049,241, Cl. 259-4.0AC.
Tanimoto, Kenji: *See—*
Hosaka, Hirokazu; Tanimoto, Kenji; and Yamachika, Hiroshi, 4,049,720, Cl. 260-610.00B.
Taninaka, Takato: *See—*
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.
Tarsia, Joseph: *See—*
Wuchinich, David G.; and Tarsia, Joseph, 4,049,964, Cl. 250-221.000.
Tatay, Charles L.: *See—*
Dantzer, Peter H.; and Tatay, Charles L., 4,048,766, Cl. 52-19.000.
Tatsuoka, Masao: *See—*
Ito, Tadashi; Wakahara, Katuhiro; and Tatsuoka, Masao, 4,048,811, Cl. 62-263.000.
Taylor, George W.: *See—*
Fincke, George C.; and Taylor, George W., 4,050,040, Cl. 333-73.00C.
TBA Industrial Products Limited: *See—*
Adams, David John, 4,049,856, Cl. 427-131.000.
Team, Inc.: *See—*
Harrison, George W., 4,049,296, Cl. 285-15.000.
Technic, Inc.: *See—*
Morrissey, Ronald J., 4,049,508, Cl. 204-43.00S.
Technicon Instruments Corporation: *See—*
Burns, Donald A.; Brand, Michael J.; and Saunders, Alexander M., 4,049,381, Cl. 23-230.00R.
Tektronix, Inc.: *See—*
Winston, Fendall Gregory, IV, 4,050,024, Cl. 328-134.000.
Teledyne Industries, Inc.: *See—*
Yih, Stephen Wei Hong; Worcester, Samuel Austin, Jr.; and Rudy, Erwin, 4,049,380, Cl. 428-539.500.
Teller, Aaron Joseph, to Teller Environmental Systems, Inc. Treatment of flue gases. 4,049,399, Cl. 55-73.000.
Teller Environmental Systems, Inc.: *See—*
Teller, Aaron Joseph, 4,049,399, Cl. 55-73.000.
Terahara, Akira: *See—*
Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, 4,049,495, Cl. 195-36.00R.
Terasaki, Syuuzi: *See—*
Yoshikawa, Shinsuke; Sasaki, Tohru; and Terasaki, Syuuzi, 4,049,859, Cl. 428-172.000.
Terum, Trygve Olavson: *See—*
Gjosteen, Ole Georg; Terum, Trygve Olavson; and Aarflot, Aksel Ola, 4,049,248, Cl. 266-202.000.
Testa, Raymond Thomas: *See—*
Weinstein, Marvin Joseph; Daniels, Peter John Lovell; Wagman, Gerald Howard; and Testa, Raymond Thomas, 4,049,498, Cl. 195-96.000.

Texaco Development Corporation: *See*—
Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., 4,049,657, Cl. 260-268.0SY.
McEntire, Edward E.; and Speranza, George P., 4,049,591, Cl. 260-2.5AC.
Texas Instruments Incorporated: *See*—
Anderson, Roger Norman, 4,048,955, Cl. 118-49.500.
Boone, Gary W.; and Vandierendonck, Jerry L., 4,049,974, Cl. 307-205.000.
Hartmann, Clinton S., 4,049,958, Cl. 235-193.000.
Kitagawa, Norihisa, 4,050,061, Cl. 340-173.00R.
Slocum, Robert E., 4,049,338, Cl. 350-152.000.
Tserng, Hua Quen, 4,050,032, Cl. 330-34.000.
Texasgulf Canada Ltd.: *See*—
Freeman, George M.; Dulson, John E.; and Morris, Monica F., 4,049,514, Cl. 204-119.000.
Textron Inc.: *See*—
Chambers, William A.; Bossler, Franklin B.; and Brandkamp, Warren F., 4,050,036, Cl. 331-94.50C.
Louw, Johan August; and Ghiselin, Robert Earle, 4,049,182, Cl. 228-2.000.
Tezuka, Tohru: *See*—
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,049,645, Cl. 260-239.00B.
Thibaudon, Bruno, to Pomagalski S.A. Speed control system for a chairlift. 4,049,999, Cl. 318-305.000.
Thiolliere, Jean Pierre: *See*—
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.
Thistlethwaite, Mark K., to Vicon Supply Company, The. Door framing fixture and method. 4,048,771, Cl. 52-127.000.
Thizy, Andre: *See*—
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.
Thomas & Betts Corporation: *See*—
Peterpaul, Joseph, 4,048,839, Cl. 72-412.000.
Thomas, Hector. Gasket winding machine. 4,048,829, Cl. 72-148.000.
Thomas, Janine M.: *See*—
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,658, Cl. 260-268.0PC.
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,660, Cl. 260-268.0PC.
Thomas Salter Limited: *See*—
Mackie, Thomas Barnet, 4,049,265, Cl. 273-1.00R.
Thomas, Werner Friedrich: *See*—
Grof, Helmut Theodor; Schumann, Jochen; Wamser, Anton; Schumann, Rainer; and Thomas, Werner Friedrich, 4,049,039, Cl. 164-52.000.
Thomason, Harry E. Solar-energy conserving. 4,048,812, Cl. 62-264.000.
Thompson, Arthur H.; and Whittingham, M. Stanley, to Exxon Research & Engineering Co. Intercalated transition metal phosphorus trisulfides. 4,049,879, Cl. 429-191.000.
Thompson, Mary Kay. Carton opener. 4,048,719, Cl. 30-2.000.
Thompson, Robert B.: *See*—
Alers, George A.; and Thompson, Robert B., 4,048,847, Cl. 73-67.50R.
Thomsen, Finn Erling: *See*—
Udengaard, Poul Werner; Mosevang, Orla; Thomsen, Finn Erling; and Eklund, Erik Paul, 4,049,403, Cl. 55-378.000.
Thomson-CSF: *See*—
Marcy, Raymond, 4,049,961, Cl. 250-202.000.
Thorpe, Donald H., to Hooker Chemicals & Plastics Corporation. Pigmentable low-profile polyester molding compositions. 4,049,749, Cl. 260-862.000.
Thorup, Palle. Dental explorer. 4,048,723, Cl. 32-40.00R.
Tice, Vernon Lawton; and Glover, Donald Francis. Fireplace/forced air furnace heat generation and distribution system. 4,049,194, Cl. 237-1.00A.
Tierney, William S.: *See*—
Jacoby, Jerold L.; Tierney, William S.; Wright, James E.; and Bhuta, Pravin G., 4,049,336, Cl. 350-3.500.
TII Corporation: *See*—
Simokat, Frank L., 4,050,092, Cl. 361-56.000.
Tijburg, Rudolf Paulus, to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 4,049,488, Cl. 156-655.000.
Tilston, John Ronald: *See*—
Hakluytt, John Philip Dabbs; and Tilston, John Ronald, 4,048,797, Cl. 60-39.72R.
Timmler, Helmut; Draber, Wilfried; Buchel, Karl Heinz; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Method of regulating plant growth. 4,049,418, Cl. 71-76.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Itoh, Takuji; Nishikawa, Eiichiroh; Miura, Tadashi; and Yamahata, Takashi, 4,049,581, Cl. 252-466.0PT.
Toby, Max Edward. Loader for sliced comestible product. 4,048,784, Cl. 53-77.000.
Tocci, Gerald Charles: *See*—
Falk, Henry Joseph; and Tocci, Gerald Charles, 4,048,813, Cl. 62-297.000.
Tocker, Stanley, to Du Pont de Nemours, E. I., and Company. Novel carbamimidoyl chlorides and their use in the synthesis of herbicidal triazinediones. 4,049,710, Cl. 260-544.00C.
Todd, John Arnold; and Chevallier, George Edward, to Dresser Industries, Inc. Hand drive for blending-type gasoline dispenser. 4,049,159, Cl. 222-144.500.
Togawa, Kimmochi; Takao, Hiroshi; Matoba, Kazuo; and Kishida, Katsuhiro, to Nissan Motor Company, Limited. Oxygen sensor with noncatalytic electrode. 4,049,524, Cl. 204-195.00S.
Tokico, Ltd.: *See*—
Takada, Shunsuke; and Sato, Kazunori, 4,049,772, Cl. 423-54.000.
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Fujita, Tadao, to Sony Corporation. Electrodepositing method. 4,049,507, Cl. 204-39.000.
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Enomoto, Masahisa, to Sony Corporation. Electrolyzer. 4,049,530, Cl. 204-273.000.
Tokuyama Sekisui Kogyo Kabushiki Kaisha: *See*—
Adachi, Terufumi; and Oda, Tatsuro, 4,049,517, Cl. 204-159.180.
Tokyo Optical Company, Ltd.: *See*—
Ito, Akihiko; Kaetsu, Isao; Okubo, Hiroshi; Kato, Masamichi; Hayashi, Koichiro; and Maeda, Yuji, 4,049,867, Cl. 428-412.000.
Tokyu Sharyo Seizo Kabushiki Kaisha: *See*—
Tominaga, Hiroshi; Yasunami, Kazuo; Saito, Shinroku; Takamatsu, Masanobu; and Sawaoka, Akira, 4,049,367, Cl. 425-77.000.
Tolan, John R.: *See*—
Cole, Leon J.; and Tolan, John R., 4,049,168, Cl. 226-40.000.
Tolle, Albert E., Jr. Cathode structure for electrolytic apparatus employing impellers. 4,049,512, Cl. 204-212.000.
Toman, Donald J., to Tull Aviation Corporation. Blended step scan beam signal from fixed beam components. 4,050,074, Cl. 343-106.00R.
Tomco, Inc.: *See*—
Byers, James Otto, Jr., 4,049,232, Cl. 251-30.000.
Tomczak, Lawrence William: *See*—
Crall, Frederick William; and Tomczak, Lawrence William, 4,050,093, Cl. 361-383.000.
Tomczuk, Zygmunt: *See*—
Vissers, Donald R.; Nelson, Paul A.; Kaun, Thomas D.; and Tomczuk, Zygmunt, 4,048,715, Cl. 29-623.500.
Tomei, L. David, to United States of America, Agriculture. Vaccine production process. 4,049,494, Cl. 195-1.100.
Tomida, Masayuki: *See*—
Shigematsu, Taichiro; Shibahara, Tetsuya; Nakazawa, Makoto; Tomida, Masayuki; and Munakata, Toshio, 4,049,820, Cl. 424-273.00P.
Tominaga, Hiroshi; Yasunami, Kazuo; Saito, Shinroku; Takamatsu, Masanobu; and Sawaoka, Akira, to Tokyu Sharyo Seizo Kabushiki Kaisha. Apparatus for generating shock waves by means of a supersonic projectile. 4,049,367, Cl. 425-77.000.
Tomo, Daniel: *See*—
Stiles, Claude J.; and Tomo, Daniel, 4,049,147, Cl. 215-12.00R.
Tonomura, Shinji: *See*—
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,049,645, Cl. 260-239.00B.
Tonsfeldt, Wayne S.: *See*—
Eisenhardt, Fred W.; and Tonsfeldt, Wayne S., 4,049,058, Cl. 171-58.000.
Tooth, Robert Barry: *See*—
Priest, John Garrick; and Tooth, Robert Barry, 4,049,484, Cl. 156-285.000.
Toray Industries, Inc.: *See*—
Mineo, Masatoshi; Oka, Ken-ichiro; Nakagawa, Kiyoshi; Matsuda, Hiyoshi; Ohno, Shigeo; and Takagi, Yasuo, 4,049,763, Cl. 264-176.00F.
Toriumi, Shiro; and Yamagishi, Seiichi, to Minolta Camera Kabushiki Kaisha. Film carrier for microfilm reader. 4,049,341, Cl. 353-23.000.
Tornabene, Michael G. Process and device for harnessing wave energy. 4,048,801, Cl. 60-502.000.
Tortolo, Norman Patrick. Terrazzo structure having a sub-surface and an intermediate impermeable sheet. 4,049,853, Cl. 428-70.000.
Toyoda-Koki Kabushiki-Kaisha: *See*—
Kawabata, Minoru; and Takahashi, Kenji, 4,048,904, Cl. 91-375.00A.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Futamura, Kazumasa, 4,049,387, Cl. 23-277.00C.
Sanda, Shoogo; and Nakamura, Norihiko, 4,048,973, Cl. 123-191.0SP.
Tracor, Inc.: *See*—
Anthony, Albert M., 4,050,042, Cl. 335-212.000.
Traister, Andrew; and Troup, Glenn, to PPG Industries, Inc. Corrosion resistant aqueous and solvent-based primer compositions containing synergistic blends of zinc borate and barium metaborate pigments. 4,049,596, Cl. 260-18.0EP.
Treanor, Eugene Joseph, to Makap Limited. Closure caps for vessels. 4,049,152, Cl. 220-209.000.
Treen, J. Paul. Reversible sickle-bar type lawn mower and trimmer. 4,048,791, Cl. 56-17.600.
Treibacher Chemische Werke Aktiengesellschaft: *See*—
Hafner, Leo, 4,049,463, Cl. 106-288.00B.
Treuner, Uwe D.: *See*—
Breuer, Hermann; and Treuner, Uwe D., 4,049,651, Cl. 544-21.000.
Trezise, Richard D.: *See*—
Plaza, Mario G.; and Trezise, Richard D., 4,049,109, Cl. 197-53.000.
Tribotech: *See*—
Gilding, Denis K., 4,049,506, Cl. 204-38.00R.

Trickett, Elizabeth Ann: *See*—
Auborn, James J.; and Trickett, Elizabeth Ann, 4,049,024, Cl. 140-71.500.
Tritsch, Ludwig, to Johnson & Johnson. Diaper with resealable tape closure. 4,049,001, Cl. 128-287.000.
Troup, Glenn: *See*—
Traister, Andrew; and Troup, Glenn, 4,049,596, Cl. 260-18.0EP.
Trudeau, Albert R. Method for rebuilding pinsetter pulley assemblies. 4,048,704, Cl. 29-401.00R.
TRW Inc.: *See*—
Haller, Freidrich A., 4,048,711, Cl. 29-566.300.
Jacoby, Jerold L.; Tierney, William S.; Wright, James E.; and Bhuta, Pravin G., 4,049,336, Cl. 350-3.500.
Wuerker, Ralph F.; and Heflinger, Lee O., 4,050,035, Cl. 331-94.50C.
Tserng, Hua Quen, to Texas Instruments Incorporated. Avalanche diode amplifier. 4,050,032, Cl. 330-34.000.
Tsuda, Yoshio: *See*—
Okamoto, Hiroyuki; Tsuda, Yoshio; and Yokoyama, Kazumasa, 4,049,683, Cl. 260-410.700.
Tsujita, Yoshio: *See*—
Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, 4,049,495, Cl. 195-36.00R.
Tsukagawa, Yukio: *See*—
Kawakami, Hiroshi; Nagaoka, Isao; and Tsukagawa, Yukio, 4,049,170, Cl. 226-74.000.
Tucker, Anthony John Philip: *See*—
McOnie, Malcolm Peter; Tucker, Anthony John Philip; and van Lienden, Peter Willem, 4,049,895, Cl. 526-62.000.
Tujimoto, Hiroaki; Maki, Tatuya; Suganuma, Sadao; and Sano, Taketora, to Nippon Chemical Industrial Co., Ltd.; and Yamato Shokaki Co., Ltd. Foam fire extinguishing agent. 4,049,556, Cl. 252-3.000.
Tull Aviation Corporation: *See*—
Toman, Donald J., 4,050,074, Cl. 343-106.00R.
Turin, Michel J.: *See*—
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,658, Cl. 260-268.0PC.
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,660, Cl. 260-268.0PC.
Turner, Henry Neil. Method and device for separating particles. 4,049,544, Cl. 209-45.000.
Tutsek, Alexander; and Bartha, Peter, to Refratechnik GmbH. Method of producing low-carbon, white husk ash. 4,049,464, Cl. 106-288.00B.
Tyslauk, Willy, to Gewerkschaft Eisenhutte Westfalia. Chain drum for chain conveyors. 4,049,112, Cl. 198-834.000.
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, to Nippon Kokan Kabushiki Kaisha; Kayaba Kogyo Kabushiki Kaisha; and Nihon Koki Kabushi Kaisha. Apparatus and method for selectively supporting, conveying and mounting a propeller and rudder. 4,048,936, Cl. 114-65.00R.
Uckert, Gotthard: *See*—
Divivier, Rudolf; and Uckert, Gotthard, 4,049,777, Cl. 423-239.000.
Udengaard, Poul Werner; Mosevang, Orla; Thomsen, Finn Erling; and Eklund, Erik Paul, to H. Moldow A/S. Device for suspension of air filter bags. 4,049,403, Cl. 55-378.000.
Ueberdiek, Ralf: *See*—
Bach, Josef; Kollwig, Horst; Meitzner, Wolfgang; Weintritt, Horst; and Ueberdiek, Ralf, 4,049,209, Cl. 242-18.0PW.
Ueda, Ikuo: *See*—
Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,049,664, Cl. 260-294.80C.
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, to Chiyoda Chemical Engineering & Construction Co. Ltd.; and Mitsubishi Petrochemical Company Limited. Process for the thermal cracking of heavy oils with a fluidized particulate heat carrier. 4,049,540, Cl. 208-127.000.
Ueno, Akihiko, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 4,049,938, Cl. 219-10.55R.
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Production of antibiotics neothramycin A and neothramycin B. 4,049,497, Cl. 195-80.00R.
Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, to Fujisawa Pharmaceutical Co., Ltd. Chromone compounds. 4,049,664, Cl. 260-294.80C.
Umlauf, Werner: *See*—
Bockstiegel, Gerd-Edzard; Neidhardt, Manfred; Rehfeld, Gerhard; and Umlauf, Werner, 4,049,397, Cl. 51-309.00A.
Undin, Hans, to Pressmaster Ltd. Device, particularly of the pliers or scissors type. 4,048,877, Cl. 81-313.000.
Union Carbide Corporation: *See*—
Beatty, Theodore Robert, 4,049,882, Cl. 429-94.000.
Elbert, Raymond John; and Farrier, Ernest Gilbert, 4,049,428, Cl. 75-208.00R.
Falk, Henry Joseph; and Tocci, Gerald Charles, 4,048,813, Cl. 62-297.000.
Kallen, George Harold, 4,049,962, Cl. 250-202.000.
Kanner, Bernard; and Prokai, Bela, 4,049,674, Cl. 260-332.100.
Kanner, Bernard; and Prokai, Bela, 4,049,675, Cl. 260-332.100.
Krebs, Daniel Fritz; and Miranda, Hector, 4,049,192, Cl. 233-14.00R.
Kronenberg, Marvin Lee, 4,049,892, Cl. 429-194.000.
Kubus, James Michael; Seese, Ray Bruce; and Watson, Bela Lee, 4,048,757, Cl. 51-436.000.
Sandner, Michael Ray; and Duffy, Robert Donovan, 4,049,931, Cl. 260-2.5AC.
Schilling, Curtis Louis, Jr., 4,049,676, Cl. 260-332.100.
Union Oil Company of California: *See*—
Duthweiler, Frederick C., 4,048,808, Cl. 61-103.000.
Unipas, Inc.: *See*—
Piette, Leonard A., 4,048,717, Cl. 29-732.000.
Uniroyal, Inc.: *See*—
Bell, Richard; Sato, Takao; and Lahiri, Chitta Ranjan, 4,048,865, Cl. 74-231.00R.
Mao, Chung-Ling; and O'Shea, Francis X., 4,049,636, Cl. 260-77.5CR.
Uniroyal Limited: *See*—
Bell, Richard; Sato, Takao; and Lahiri, Chitta Ranjan, 4,048,865, Cl. 74-231.00R.
United Foam Corporation: *See*—
Goodale, Clark W.; Morgan, Charles W.; and Rhoton, Albert L., 4,049,848, Cl. 427-244.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Hakluytt, John Philip Dabbs; and Tilston, John Ronald, 4,048,797, Cl. 60-39.72R.
United States Borax & Chemical Corporation: *See*—
Shen, Kelvin Kei-Wei; and Belles, Wayne Stuart, 4,049,422, Cl. 71-92.000.
United States Gypsum Company: *See*—
Lane, Marvin K.; and Anderson, Winton C., 4,049,866, Cl. 428-402.000.
United States of America
Agriculture: *See*—
Jurd, Leonard, 4,049,722, Cl. 260-619.00R.
Luddy, Francis E.; Hampson, James W.; and Herb, Samuel F., 4,049,839, Cl. 426-607.000.
Tomei, L. David, 4,049,494, Cl. 195-1.100.
Air Force: *See*—
Barry, James D.; and Brandelik, Joseph E., 4,050,034, Cl. 331-94.50G.
Berg, Robert L.; Murphy, William J.; and Simmons, Dennis E., Jr., 4,050,068, Cl. 343-6.00R.
Cohen, Paul B., 4,049,982, Cl. 310-366.000.
Crocker, Thomas H.; Levitt, Barry N.; and Suprenant, Paul J., 4,050,062, Cl. 340-183.000.
Maurer, John H., 4,049,198, Cl. 239-265.390.
Peterson, Paul F., 4,049,222, Cl. 244-137.00R.
Salonimer, David J.; and Kelley, Buster E., 4,049,969, Cl. 250-458.000.
Army: *See*—
Fincke, George C.; and Taylor, George W., 4,050,040, Cl. 333-73.00C.
Nirschl, Joseph C., 4,050,019, Cl. 324-115.000.
Sagalyn, Paul L.; and Alexander, Michael N., 4,050,009, Cl. 324-.5AC.
Schlussler, Henry, 4,050,069, Cl. 343-6.50R.
Schrader, William L.; and Rose, Harold T., 4,049,131, Cl. 214-14.000.
Energy Research and Development Administration: *See*—
Googin, John M.; Schmitt, Charles R.; Schreyer, James M.; and Whitehead, Harlan D., 4,048,980, Cl. 126-270.000.
Hagel, William C.; Smidt, Frederick A.; and Korenko, Michael K., 4,049,431, Cl. 75-126.00C.
Hagel, William C.; Smidt, Frederick A.; and Korenko, Michael K., 4,049,432, Cl. 75-128.00F.
Hoover, William R.; Mead, Keith E.; and Street, Henry K., 4,049,864, Cl. 428-332.000.
Robinson, C. Paul; Rockwood, Stephen D.; Jensen, Reed J.; Lyman, John L.; and Aldridge, Jack P., III, 4,049,515, Cl. 204-157.10R.
Vissers, Donald R.; Nelson, Paul A.; Kaun, Thomas D.; and Tomczuk, Zygmunt, 4,048,715, Cl. 29-623.500.
Interior: *See*—
Oden, Laurance L.; Sanker, Philip E.; and Russell, James H., 4,049,580, Cl. 252-466.003.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Kessinger, Roger L. Hearing aid malfunction detection system. 4,049,930, Cl. 179-175.10A.
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Cotton, Charles C.; and Jencks, Guy S. D., 4,048,942, Cl. 114-253.000.
Evans, Albert B., Jr., 4,049,953, Cl. 235-150.300.
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United States Trading International, Inc.: *See—*
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Unitta Company Limited: *See—*
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Martan, Michael, 4,049,733, Cl. 260-668.00C.
Neuzil, Richard W.; and deRosset, Armand J., 4,049,688, Cl. 260-428.000.
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Peterson, David C., 4,049,678, Cl. 260-343.410.
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Vaseen, Vesper A. Separating oxygen from the air by means of dissolving air in a nonmagnetic, inert liquid and then paramagnetically collecting the oxygen from the liquid. 4,049,398, Cl. 55-3.000.

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Vcelka, John Leonard; and Winchell, David A., to Baxter Travenol Laboratories, Inc. Attaching means and method for attaching flexible tubing to a plastic container. 4,049,034, Cl. 150-8.000.

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Anderson, Arnold L., 4,049,619, Cl. 260-45.75B.
Anderson, Arnold L., 4,049,620, Cl. 260-45.75R.
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Ventz, George A., to General Corrugated Machinery Co., Inc. Method of and apparatus for feeding sheets. 4,049,259, Cl. 271-151.000.

Verbeek, Francois; Bulten, Eric J.; and van den Hurk, Jan W. G., to Commer S.r.l. Method for the preparation of alkyl tin halides. 4,049,689, Cl. 260-429.700.

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Vereschagin, Leonid Fedorovich; Yakovlev, Evgeny Nikolaevich; Varfolomeeva, Tatyana Dmitrievna; Preobrazhensky, Alexandr Yakovlevich; Slesarev, Vladislav Nikolaevich; Stepanov, Vasily Alexandrovich; and Shterenberg, Ljudmila Efimovna. Method of producing polycrystalline diamonds. 4,049,783, Cl. 423-446.000.

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Thistlethwaite, Mark K., 4,048,771, Cl. 52-127.000.
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Pettipher, Rodney; Viellevoye, Lucien Nicolas Leon; and Kruithof, Albert, 4,050,095, Cl. 364-200.000.
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Vissers, Donald R.; Nelson, Paul A.; Kaun, Thomas D.; and Tomczuk, Zygmunt, to United States of America, Energy Research and Development Administration. Method of preparing porous, active material for use in electrodes of secondary electrochemical cells. 4,048,715, Cl. 29-623.500.
Vital, Zoltan; and Orban, Jean, to Ponder & Best, Inc. Control of electronically generated light pulses. 4,049,996, Cl. 315-151.000.
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Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,049,682, Cl. 260-410.000.
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Wagner, Oliver, to Petrolite Corporation. Color improvement process for organic liquid. 4,049,520, Cl. 204-186.000.
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Walker, George, to AB Svenska Flaktfabriken. Color spray booth and method of ventilating the same. 4,048,912, Cl. 98-115.0SB.
Wallace, Dewey K. Magnetic radio mounting bracket. 4,049,333, Cl. 339-12.00R.
Wallace, Joseph W., to Reynolds Metals Company. Method of bottom embossing. 4,048,934, Cl. 113-120.00H.
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Walters, Robert A.; and Kolenik, Steve A., to ARCO Medical Products Company. Digital cardiac pacer. 4,049,003, Cl. 128-419.0PG.
Walters, Robert A., to ARCO Medical Products Company. Implantable digital cardiac pacer having externally selectible operating parameters and "one shot" digital pulse generator for use therein. 4,049,004, Cl. 128-419.0PG.
Walters, Thomas, Jr., to Ecolaire Incorporated. Continuous mixer and unloader. 4,049,240, Cl. 259-3.000.
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Webb, James W. Method and apparatus for forming flanges. 4,049,482, Cl. 156-172.000.
Webb, Oswald, to GKN Transmissions Limited. Control couplings. 4,048,872, Cl. 74-711.000.
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Weigel, Horst; and Spitz, Anton, deceased (by Schurmann, Barbara Wilhelmine Spitz nee, legal representative), to Klockner-Humboldt-Deutz Aktiengesellschaft. Method for thermal treatment of nickel ore. 4,049,445, Cl. 75-82.000.
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Weir, Robert. Plenum cover for roof mounted vehicle air conditioner. 4,048,910, Cl. 98-2.160.

Weirich, Walter; and Kussel, Willy, to Gewerkschaft Eisenhutte Westfalia. Apparatus for use in controlling the tension of a chain or chains of mining equipment. 4,048,866, Cl. 74-242.1FP.

Weis, Martin; and Scholz, Adolf, to Badische Maschinenfabrik GmbH. Sand-blasting machine for castings. 4,048,758, Cl. 51-416.000.

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Weiss, Jean; and Zalmanski, Alain, to Produits Chimiques Ugine Kuhlmann. Polyesters and process for their preparation. 4,049,628, Cl. 260-47.0UA.

Weissel, Oskar, to Bayer Aktiengesellschaft. Supported ruthenium catalyst and process for preparing it. 4,049,584, Cl. 252-470.000.

Weitz, Hans-Martin; Wagner, Ulrich; Volkamer, Klaus; Schubert, Eckart; and Bandermann, Friedhelm, to BASF Aktiengesellschaft. Recovery of 1,3-butadiene from a C_4-hydrocarbon mixture. 4,049,742, Cl. 260-681.50R.

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Wenckus, Joseph F.; Menashi, Wilson P.; and Castonguay, Roger A., to Arthur D. Little, Inc. Cold crucible system. 4,049,384, Cl. 23-273.0SP.

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Fink, Helmuth; and Wess, Guenter, 4,050,014, Cl. 324-57.00H.

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Woidke, Richard Paul; Wester, Thomas Joseph; and Brosch, Eric Joseph, 4,048,861, Cl. 74-56.000.

Western Digital Corporation: *See—*
Dru, Luke William; and Hwang, Yun Sheng, 4,049,978, Cl. 307-270.000.

Western Electric Company, Inc.: *See—*
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Western Geophysical Co. of America: *See—*
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Westinghouse Air Brake Company: *See—*
Jeffrey, William B., 4,049,128, Cl. 213-1.600.

Westinghouse Electric Corporation: *See—*
Frink, Russell E.; and Milianowicz, Stanislaw A., 4,049,936, Cl. 200-146.00R.

Wheeler, Charles J. Chain saw guide apparatus. 4,048,720, Cl. 30-166.00A.

Whirlpool Corporation: *See—*
Pielemeier, John William, 4,048,820, Cl. 68-133.000.

White, Dwain M., to General Electric Company. Polyetherimide composites. 4,049,613, Cl. 260-37.00N.

White, George Raymond: *See—*
Durant, Graham John; Ganellin, Charon Robin; and White, George Raymond, 4,049,671, Cl. 548-342.000.

White, Howard S.: *See—*
Magnusson, Alan B.; and White, Howard S., 4,049,632, Cl. 260-75.0NE.

White, Leonard Alan, to Baxter Travenol Laboratories, Inc. Moisture detection system for a sterile package. 4,049,121, Cl. 206-439.000.

White, Ralph L., Jr., to Morton-Norwich Products, Inc. 1-[[[5-(Substituted phenyl)-2-oxazolyl]methylene]amino]-2,4-imidazolidinediones. 4,049,650, Cl. 542-400.000.

Whitehead, Harlan D.: *See—*
Googin, John M.; Schmitt, Charles R.; Schreyer, James M.; and Whitehead, Harlan D., 4,048,980, Cl. 126-270.000.

Whitehead & Kales Company: *See—*
Peisner, Israel Daniel, 4,049,229, Cl. 248-503.000.

Whittingham, M. Stanley, to Exxon Research & Engineering Co. Electrochemical cells with cathode-active materials of layered compounds. 4,049,887, Cl. 429-112.000.

Whittingham, M. Stanley: *See—*
Thompson, Arthur H.; and Whittingham, M. Stanley, 4,049,879, Cl. 429-191.000.

Wibben, Warren G. Roofing system. 4,048,924, Cl. 104-245.000.

Wicker, Alain: *See—*
Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, 4,049,884, Cl. 429-104.000.
Driole, Jean; Allibert, Colette; Bonnier, Etienne; and Wicker, Alain, 4,049,437, Cl. 75-10.00R.

Wicker, Thomas H., Jr.: *See—*
Gilkey, Russell; Hilbert, Samuel D.; and Wicker, Thomas H., Jr., 4,049,621, Cl. 260-40.000.

Wickman Machine Tool Sales Limited: *See—*
Yearsley, Norman, 4,049,282, Cl. 279-50.000.

Widman, D. Edward. Fuel vaporizer apparatus. 4,048,969, Cl. 123-133.000.

Wiechert, Rudolf: *See—*
Laurent, Henry; Annen, Klaus; Wiechert, Rudolf; and Hofmeister, Helmut, 4,049,804, Cl. 424-242.000.

Wiedenmann, Rudolf: *See—*
Kammel, Gernot; and Wiedenmann, Rudolf, 4,049,757, Cl. 264-22.000.

Wiegand, Walter J., Jr.: *See—*
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Wier, Donald R., to Phillips Petroleum Company. Stable mixtures of polymers and surfactants for surfactant flooding. 4,049,054, Cl. 166-273.000.

Wiersum, Ulfert Elle: *See—*
Oosterwijk, Hendrik Harm Jannes; Wiersum, Ulfert Elle; Magre, Eduard Pieter; and van Dijk, Johannes Hendrinus, 4,049,726, Cl. 260-649.00R.

Wiese, Volkhard: *See—*
Elsener, Anton; Gehrt, Hans Harald; Medinger, Bernhard; and Wiese, Volkhard, 4,049,615, Cl. 260-39.00P.

Wiesner, Paul: *See—*
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Wiest, Peter P.: *See—*
Lindemann, Hans-Joachim; and Wiest, Peter P., 4,048,992, Cl. 128-184.000.

Wild, Albrecht: *See—*
Schacht, Erich; Mehrhof, Werner; Wild, Albrecht; Gante, Joachim; and Kurmeier, Hans-Adolf, 4,049,823, Cl. 424-308.000.

Wiles, Michael F.: *See—*
Bennett, Thomas H.; and Wiles, Michael F., 4,050,096, Cl. 364-200.000.

Wilhelm Hedrich Vakuumanlagen, Firma: *See—*
Hedrich, Wilhelm, 4,049,244, Cl. 259-185.000.

Will, Fritz G., to General Electric Company. Rechargeable aqueous metal-halogen cell. 4,049,886, Cl. 429-105.000.

Will, Kurt: *See—*
Seifert, Hans; Will, Kurt; and Zapf, Horst, 4,048,974, Cl. 123-191.00M.

Williams, John Lloyd; Leaman, Roger John; Moberly, Robert Valentine; Stagg, Geoffrey Brian Kenneth; and Wisdom, Graham John, to Plessey Handel und Investments A.G. Data processing read and hold facility. 4,050,059, Cl. 364-200.000.

Williams, Robert W. Suction retraction instrument. 4,049,000, Cl. 128-276.000.

Wilson, Chester K., to Cutler-Hammer, Inc. Thermostatic switch. 4,050,046, Cl. 337-319.000.

Wilson, Clive Westgarth: *See—*
Metcalfe, Kenneth A.; Wilson, Clive Westgarth; and Field, Denton, 4,049,446, Cl. 96-1.0LY.

Wilson, George D.: *See—*
Kovach, Stephen M.; and Wilson, George D., 4,049,576, Cl. 252-441.000.

Wilson Greatbatch Ltd.: *See—*
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Wilson, Henry G. E.: *See—*
Estebanez, Joseph; Harrison, David V.; Jones, Clifford P.; and Wilson, Henry G. E., 4,048,956, Cl. 118-306.000.

Wilson, Robert B., to National Blank Book Company, Inc. Tape cassette filing unit. 4,049,119, Cl. 206-387.000.

Wilson, Ronald C.: *See—*
Rei, Nuno M.; and Wilson, Ronald C., 4,049,822, Cl. 424-297.000.

Winchell, David A.: *See—*
Vcelka, John Leonard; and Winchell, David A., 4,049,034, Cl. 150-8.000.

Wingert, Rudolf: *See—*
Bako, Lazlo; and Wingert, Rudolf, 4,048,821, Cl. 70-25.000.

Winings, Richard H.: *See—*
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Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG: *See—*
Ehlscheid, Gunter; Langenbeck, Peter; and Stemmler, Kurt, 4,049,945, Cl. 219-121.0LM.

Winn, James Buchanan, Jr., to Archilithic Company, The. Fiber shear system. 4,048,884, Cl. 83-24.000.

Winn, Martin, to Abbott Laboratories. Heterocyclic esters of alkylphenyl benzopyrans. 4,049,653, Cl. 544-150.000.

Winslow, Joseph D., Jr., to Petrolite Corporation. Electrical treater with a.c-d.c. electrical fields. 4,049,535, Cl. 204-305.000.

Winston, Fendall Gregory, IV, to Tektronix, Inc. Sideband detector. 4,050,024, Cl. 328-134.000.

Winter, Walter W.: *See*—
Nason, George F., III; and Winter, Walter W., 4,048,728, Cl. 35-8.00A.
Winyall, Milton Edward: *See*—
Acker, Ellsworth George; and Winyall, Milton Edward, 4,049,781, Cl. 423-338.000.
Winzeler, James E.: *See*—
Golan, Kenneth F.; and Winzeler, James E., 4,048,799, Cl. 60-413.000.
Wisdom, Graham John: *See*—
Williams, John Lloyd; Leaman, Roger John; Moberly, Robert Valentine; Stagg, Geoffrey Brian Kenneth; and Wisdom, Graham John, 4,050,059, Cl. 364-200.000.
Wise, John J.: *See*—
Garwood, William E.; Jacob, Solomon M.; Kuo, James C.; and Wise, John J., 4,049,734, Cl. 260-668.00R.
Kuo, James C.; Prater, Charles D.; and Wise, John J., 4,049,741, Cl. 260-676.00R.
Wismer, Marco: *See*—
Schimmel, Karl F.; and Wismer, Marco, 4,049,637, Cl. 260-78.0TF.
Witzel, Bruce E.; Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., to Merck & Co., Inc. Alicyclic alkylene polyamine microorganism and algae growth inhibitors. 4,049,417, Cl. 71-67.000.
Wixon, Harold Eugene, to Colgate-Palmolive Company. Fabric conditioning compositions. 4,049,557, Cl. 252-8.800.
Wohler, Fritz; Stonner, Hans-Martin; and Wiesner, Paul, to Metallgesellschaft Aktiengesellschaft. Process for producing pure concentrated ammonia. 4,049,782, Cl. 423-352.000.
Woidke, Richard Paul; Wester, Thomas Joseph; and Brosch, Eric Joseph, to Johns-Manville Corporation. Device for oscillating a rotating body along its rotational axis. 4,048,861, Cl. 74-56.000.
Wolak, Norbert S.; and Wolak, Thomas J., to Evans Products Company. Full length door arrangement for railway house car. 4,048,755, Cl. 49-130.000.
Wolak, Thomas J.: *See*—
Wolak, Norbert S.; and Wolak, Thomas J., 4,048,755, Cl. 49-130.000.
Wolf, Karlheinz: *See*—
Bunge, Wilhelm; Last, Wolf-Dieter; Saitner, Rudolf; and Wolf, Karlheinz, 4,049,610, Cl. 260-31.20N.
Wolfe, Gilbert H. Game call with two-diaphragm sounder. 4,048,750, Cl. 46-180.000.
Wolfson, Alan. Twin-brushes rotary toothbrush. 4,048,690, Cl. 15-22.00R.
Wood, Prentice J., to Mead Corporation, The. Panel interlocking means and method. 4,049,189, Cl. 229-48.00R.
Woods, Kenneth D. Water fountain control wiper unit for offset printing machines. 4,048,919, Cl. 101-148.000.
Woodward Mfg. & Sales Co., Inc.: *See*—
Garvey, Eugene N., 4,049,083, Cl. 187-9.00R.
Worcester, Samuel Austin, Jr.: *See*—
Yih, Stephen Wei Hong; Worcester, Samuel Austin, Jr.; and Rudy, Erwin, 4,049,380, Cl. 428-539.500.
Worthington, Mark N. Solar heating/cooling system. 4,049,046, Cl. 165-18.000.
Worz, Paul, to Robert Bosch GmbH. Ignition coil for internal combustion engines. 4,048,972, Cl. 123-148.00D.
Wright, Edward James, to Baker Perkins Holdings Limited. Apparatus for depositing fibrous material into containers. 4,048,785, Cl. 53-122.000.
Wright, James E.: *See*—
Jacoby, Jerold L.; Tierney, William S.; Wright, James E.; and Bhuta, Pravin G., 4,049,336, Cl. 350-3.500.
Wright, Nicholas David: *See*—
Harnden, Michael Raymond; and Wright, Nicholas David, 4,049,816, Cl. 424-270.000.
Wu, Yao Hua; and Lobeck, Walter G., to Mead Johnson & Company. N-phenyl amidines. 4,049,714, Cl. 260-564.00R.
Wuchinich, David G.; and Tarsia, Joseph, to Cavitron Corporation. Optical switching device. 4,049,964, Cl. 250-221.000.
Wuerker, Ralph F.; and Heflinger, Lee O., to TRW Inc. Self-aligned polarized laser. 4,050,035, Cl. 331-94.50C.
Wyman-Gordon Company: *See*—
Eddy, Robert A.; Gustafson, Norman F.; and Erwin, Stephen J., 4,048,836, Cl. 72-364.000.
Wyszynski, Apoloniusz: *See*—
Such, Tony Eugene; Wyszynski, Apoloniusz; and James, Barrie Sydney, 4,049,509, Cl. 204-49.000.
Xenex Corporation: *See*—
Zettler, John Francis, 4,048,886, Cl. 83-58.000.
Xerox Corporation: *See*—
Azar, Jack C.; Hoffend, Thomas A.; and Jacknow, Burton B., 4,049,447, Cl. 96-1.0SD.
Frechette, Kenneth R., 4,049,110, Cl. 197-53.000.
Garlic, Richard A., 4,050,058, Cl. 364-200.000.
Hause, Jonathan E., 4,049,180, Cl. 227-78.000.
Hermanson, Herman A., 4,049,343, Cl. 355-3.00P.
Marsh, Dana G., 4,049,449, Cl. 96-1.50R.
Pfister, Gustav R.; and Maher, James C., 4,050,027, Cl. 330-5.000.
Plaza, Mario G.; and Trezise, Richard D., 4,049,109, Cl. 197-53.000.
Rote, Everett Arthur, 4,048,718, Cl. 29-739.000.
Simpson, George R.; Gundlach, Robert W.; and Butler, Gordon C., 4,049,344, Cl. 355-10.000.
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,049,255, Cl. 271-3.000.
Yagita, Yasunobu, to Keisuke Honda. Multi-contact brush type fish detecting sonar. 4,050,054, Cl. 340-3.00F.
Yakovlev, Evgeny Nikolaevich: *See*—
Vereschagin, Leonid Fedorovich; Yakovlev, Evgeny Nikolaevich; Varfolomeeva, Tatyana Dmitrievna; Preobrazhensky, Alexandr Yakovlevich; Slesarev, Vladislav Nikolaevich; Stepanov, Vasily Alexandrovich; and Shterenberg, Ljudmila Efimovna, 4,049,783, Cl. 423-446.000.
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Yamada, Takahiro; and Doi, Tetsuo, to Hitachi, Ltd. Liquid droplet supplying system. 4,050,077, Cl. 346-75.000.
Yamagishi, Seiichi: *See*—
Toriumi, Shiro; and Yamagishi, Seiichi, 4,049,341, Cl. 353-23.000.
Yamaguchi, Toshiaki; and Shoji, Jinichi, to Nishimura Seisakusho Co., Ltd. Apparatus for independently rewinding slit strips in a web slitting and rewinding machine. 4,049,212, Cl. 242-56.900.
Yamaguchi, Toshiaki; and Shoji, Jinichi, to Nishimura Seisakusho Co., Ltd. Method and apparatus for driving rewinding shafts for slit strips. 4,049,214, Cl. 242-75.510.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Masae, Watanabe, 4,049,251, Cl. 267-64.00R.
Yamahata, Takashi: *See*—
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Yamai, Fumito: *See*—
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Yamamoto, Minoru: *See*—
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Yamamoto, Takaharu; Nomura, Toshio; Asai, Tsuyoshi; and Hara, Akio, to Sumitomo Electric Industries, Ltd. Cemented carbonitride alloys. 4,049,876, Cl. 428-932.000.
Yamamoto, Yoichi: *See*—
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.
Yamamoto, Yoshiharu: *See*—
Hori, Yutaka; Honda, Zenzo; Suzuki, Kenji; Nakamoto, Keiji; and Yamamoto, Yoshiharu, 4,049,904, Cl. 174-107.000.
Yamamoto, Yukio, to Yoshida Kogyo Kabushiki Kaisha. Exterior window unit having adapter sill member. 4,048,774, Cl. 52-202.000.
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Yamashita, Daizo. Belt saw guiding device for a belt saw machine. 4,048,892, Cl. 83-799.000.
Yamato Scale Company, Limited: *See*—
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Tujimoto, Hiroaki; Maki, Tatuya; Suganuma, Sadao; and Sano, Taketora, 4,049,556, Cl. 252-3.000.
Yamazaki, Masahiro, to Nippon Zeon Co., Ltd. Method for setting end portion of bundle of thread-like bodies. 4,049,765, Cl. 264-261.000.
Yan, Tsoung Y.; Huang, Tracy J.; and Haag, Werner O., to Mobil Oil Corporation. Two-stage process for upgrading naphtha. 4,049,539, Cl. 208-65.000.
Yanagisawa, Takeshi; and Osuga, Motoyuki, to Kabushiki Kaisha Seikosha. Buzzer. 4,050,066, Cl. 340-388.000.
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Seiger, Harvey N., 4,049,027, Cl. 141-1.100.
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Yasunami, Kazuo: *See*—
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Yasuta, Toru: *See*—
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Yats, Larry D.: *See*—
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Yeakey, Ernest L.: *See*—
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Yearsley, Norman, to Wickman Machine Tool Sales Limited. Collet actuating mechanisms. 4,049,282, Cl. 279-50.000.
Yeh, Tsu-Hsing: *See*—
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Yeich, Clifford R., Jr.: *See*—
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Yevick, George J., to Izon Corporation. Method of making microfiche laminate having apertures with doublet lenses. 4,049,756, Cl. 264-1.000.
Yih, Stephen Wei Hong; Worcester, Samuel Austin, Jr.; and Rudy,

Erwin, to Teledyne Industries, Inc. Cemented carbides containing hexagonal molybdenum. 4,049,380, Cl. 428-539.500.
Yoder, Perry E. Recreational vehicle with expansible section. 4,049,310, Cl. 296-26.000.
Yokoyama, Kazumasa: *See*—
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York, David L.: *See*—
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Yoshida Kogyo Kabushiki Kaisha: *See*—
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Kawakami, Koichi; and Osaki, Tatsuo, 4,049,155, Cl. 221-192.000.
Takamatsu, Ikuo, 4,048,698, Cl. 24-205.14R.
Yamamoto, Yukio, 4,048,774, Cl. 52-202.000.
Yoshikawa, Shinsuke; Sasaki, Tohru; and Terasaki, Syuuzi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Metallized film. 4,049,859, Cl. 428-172.000.
Yoshioka, Shigeo: *See*—
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Youmans, Albert P., to Signetics Corporation. Solid state force transducer, support and method of making same. 4,050,049, Cl. 338-47.000.
Young, David A., to Hoover Ball and Bearing Company. Trailer hitch. 4,049,288, Cl. 280-406.00A.
Young, John S., to GTE Automatic Electric Laboratories Incorporated. Communication system trunk circuit. 4,049,919, Cl. 179-18.0FA.
Young, Lewis B., to Mobil Oil Corporation. Selective production of para-xylene. 4,049,738, Cl. 260-671.00M.
Yule, Lance S. Metering valve. 4,049,162, Cl. 222-476.000.
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Zabransky, Robert F.; and Anderson, Robert F., to UOP Inc. Simulated moving bed alkylation process. 4,049,739, Cl. 260-671.00R.
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Zakharov, Evegny Dmitrievich; Shneider, Gennady Lvovich; Valkov, Viktor Dmitrievich; Kapitonov, Viktor Pavlovich; Miklyaev, Petr Grigorievich; Lebedev, Vladimir Alexandrovich; Kholnova, Vera Ivanovna; Shesterikov, Stanislav Alexeevich; and Bobrovsky, Vasily Mikhailovich. Aluminum-based alloy. 4,049,474, Cl. 148-32.500.
Zalmanski, Alain: *See*—
Weiss, Jean; and Zalmanski, Alain, 4,049,628, Cl. 260-47.0UA.
Zamarski, Andrzej: *See*—
Dunikowski, Andrzej; Bednarczyk, Jan; Keska, Jerzy; Pisarkiewicz, Tadeusz; and Zamarski, Andrzej, 4,048,844, Cl. 73-32.00R.
Zapf, Horst: *See*—
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Zaplatin, Veniamin Petrovich; Svitelsky, Vasily Petrovich; Galov, Lev Ivanovich; Djukareva, Alla Konstantinovna; Sklyar, Rozalia Grigorievna; Denisovich, Vasily Alexeevich; Shirokov, Dmitry Alexeevich; and Shevchenko, Vladimir Alexandrovich. Electrodialysis of bleaching effluent. 4,049,490, Cl. 162-37.000.
Zeblisky, Joseph A., to General Corrugated Machinery Co., Inc. Method of and apparatus for feeding sheets. 4,049,258, Cl. 271-151.000.
Zeigler, Joseph Spence. Motorcycle safety hub. 4,049,099, Cl. 192-46.000.
Zeilon, Sten Olof. Refrigerating process and apparatus therefor. 4,048,810, Cl. 62-101.000.
Zeller, Judy A.: *See*—
Joyce, James E.; and Zeller, Judy A., 4,049,113, Cl. 206-44.00R.
Zenith Radio Corporation: *See*—
Schiecke, Konrad L., 4,050,041, Cl. 335-210.000.
Zetterlund, Ture R.; and Amberg, Arthur A., to International Harvester Company. Cab door latch mechanism. 4,049,305, Cl. 292-336.300.
Zettler, John Francis, to Xenex Corporation. Brake monitor with self-checking. 4,048,886, Cl. 83-58.000.
Zeuch, Klaus, to Siemens Aktiengesellschaft. Apparatus for producing compact polycrystalline InP and GaP ingots. 4,049,373, Cl. 432-265.000.
Zhukov, Evgeny Kuzmich: *See*—
Grinberg, Ijun Iosifovich; Zhukov, Evgeny Kuzmich; and Koshkin, Lev Nikolaevich, 4,049,389, Cl. 29-157.10R.
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Zielinski, Walter J.: *See*—
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Zimmer U.S.A., Inc.: *See*—
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Distler, Walter; Zink, Roderich; and Linke, Gerhard, 4,049,968, Cl. 250-445.00T.
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Zitting, Carl Edward; and Zitting, George Fredrick, 4,048,749, Cl. 46-126.000.
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Zitzelberger, Dorothy A.: *See*—
Zitzelberger, Donald J.; and Zitzelberger, Dorothy A., 4,048,740, Cl. 40-158.00R.
Zobel, Don W., to Motorola, Inc. Fail safe circuit for an anti-skid control apparatus. 4,049,326, Cl. 303-92.000.
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Mortl, Gunther Lorenz; Werthmann, Eckhart; and Zoglmeyr, Gunther, 4,049,461, Cl. 106-56.000.
Zollner, Wolf-Dieter, to Hartmann & Braun Aktiengesellschaft. Control of microwave generator-cavity resonator combinations for gas analyzer. 4,050,015, Cl. 324-58.50C.
Zoya, Walter J.: *See*—
Johnson, Gary L.; and Zoya, Walter J., 4,049,014, Cl. 137-315.000.
Zumbahlen, Vincent J. Combined apparatus for tilling and planting. 4,048,929, Cl. 111-85.000.
Zwack, Eduard, to Siemens Aktiengesellschaft. Method for forming a conference connection in a time division multiplex telecommunication switching system. 4,049,921, Cl. 179-18.0BC.
Zweegers, Petrus Wilhelmus. Agricultural implements. 4,048,790, Cl. 56-13.600.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF SEPTEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Blevens, Bertram G., to Huffman Manufacturing Company, The. Braking system. Re. 29,404, Cl. 188-24.000.

C. Weinberger & Co., Ltd.: *See*—
Yoshino, Toshio, Re. 29,410, Cl. 427-390.00R.

Caterpillar Tractor Co.: *See*—
Shotwell, Daniel Bronson, Re. 29,402, Cl. 16-116.00R.

Chemotronics International, Inc.: *See*—
Geen, Henry C.; and Rice, Edwin E., Re. 29,408, Cl. 148-9.00R.

Geen, Henry C.; and Rice, Edwin E., to Chemotronics International, Inc. Process for treating articles of manufacture to eliminate superfluous projections. Re. 29,408, Cl. 148-9.00R.

Gunzel, Rudolph M., Jr.; James, Donald R.; and Radecki, Tony, to Meiko, Incorporated. Spray apparatus. Re. 29,405, Cl. 239-318.000.

Huffman Manufacturing Company, The: *See*—
Blevens, Bertram G., Re. 29,404, Cl. 188-24.000.

James, Donald R.: *See*—
Gunzel, Rudolph M., Jr.; James, Donald R.; and Radecki, Tony, Re. 29,405, Cl. 239-318.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Yamazaki, Satoshi, Re. 29,403, Cl. 58-23.00D.

Meiko, Incorporated: *See*—
Gunzel, Rudolph M., Jr.; James, Donald R.; and Radecki, Tony, Re. 29,405, Cl. 239-318.000.

Mesur-Matic Electronics Corporation: *See*—
Newell, Harold R., Re. 29,411, Cl. 310-49.00R.

Minolta Camera Kabushiki Kaisha: *See*—
Ogawa, Masaya, Re. 29,407, Cl. 355-51.000.

Newell, Harold R., to Mesur-Matic Electronics Corporation. Harmonic drive for digital step motor. Re. 29,411, Cl. 310-49.00R.

Ogawa, Masaya, to Minolta Camera Kabushiki Kaisha. Surface exposure device for copying apparatus. Re. 29,407, Cl. 355-51.000.

Radecki, Tony: *See*—
Gunzel, Rudolph M., Jr.; James, Donald R.; and Radecki, Tony, Re. 29,405, Cl. 239-318.000.

Rice, Edwin E.: *See*—
Geen, Henry C.; and Rice, Edwin E., Re. 29,408, Cl. 148-9.00R.

Shotwell, Daniel Bronson, to Caterpillar Tractor Co. Vibration isolating grip for pneumatic hand tools. Re. 29,402, Cl. 16-116.00R.

Ventron Corporation: *See*—
Yeager, Charles C., Re. 29,409, Cl. 424-78.000.

Walker-Arnott, David Athelton, to Xerox Corporation. Document original handling system. Re. 29,406, Cl. 355-12.000.

Xerox Corporation: *See*—
Walker-Arnott, David Athelton, Re. 29,406, Cl. 355-12.000.

Yamazaki, Satoshi, to Kabushiki Kaisha Suwa Seikosha. Quartz crystal wrist watch. Re. 29,403, Cl. 58-23.00D.

Yeager, Charles C., to Ventron Corporation. Phenoxarsine compounds incorporated into resins with phenols. Re. 29,409, Cl. 424-78.000.

Yoshino, Toshio, to C. Weinberger & Co., Ltd. Process for manufacturing of deodorizing air filters. Re. 29,410, Cl. 427-390.00R.

LIST OF PLANT PATENTEES

Zaiger, Chris Floyd. Nectarine tree. 4,106, 9-20-77, Cl. 41.000.

Zaiger, Chris Floyd. Nectarine tree. 4,107, 9-20-77, Cl. 41.000.

Zaiger, Chris Floyd. Peach tree. 4,108, 9-20-77, Cl. 41.000.

Zaiger, Chris Floyd. Peach tree. 4,109, 9-20-77, Cl. 43.000.

Zaiger, Chris Floyd. Nectarine tree. 4,110, 9-20-77, Cl. 41.000.

LIST OF DESIGN PATENTEES

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Bostrom, Lars Sture, 245,865, Cl. D25-3.000.

Althans, Richard K.: *See*—
Boldt, Melvin H.; and Althans, Richard K., 245,841, Cl. D14-80.000.

American Optical Corporation: *See*—
Armbruster, John T., 245,863, Cl. D24-1.100.

Arendt, Gernot, to Deutsche Semperit Gummiwerk Ges. m.b.H. Pneumatic tire tread and buttress. 245,836, 9-20-77, Cl. D12-143.000.

Arendt, Gernot, to Deutsche Semperit Gummiwerk Ges. m.b.H. Pneumatic tire tread and buttress. 245,837, 9-20-77, Cl. D12-151.000.

Armbruster, John T., to American Optical Corporation. Ophthalmic instrument control board. 245,863, 9-20-77, Cl. D24-1.100.

Associated Mills, Inc.: *See*—
Grube, Clifford E., 245,855, Cl. D23-35.000.
Grube, Clifford E., 245,856, Cl. D23-35.000.
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Baikie, Hugh E.; and Schaack, Peter Willy. Ice Skate. 245,872, 9-20-77, Cl. D34-14.00B.

Baker, Joseph: *See*—
Elder, Robert, 245,861, Cl. D23-52.000.

Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, to International Business Machines Corporation. Electrophotographic machine. 245,847, 9-20-77, Cl. D16-30.000.

Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, to International Business Machines Corporation. Electrophotographic copier or the like. 245,848, 9-20-77, Cl. D16-30.000.

Boldt, Melvin H.; and Althans, Richard K., to Zenith Radio Corporation. Television receiver. 245,841, 9-20-77, Cl. D14-80.000.

Boldt, Melvin H.; and Casnovsky, William M., to Zenith Radio Corporation. Television receiver. 245,842, 9-20-77, Cl. D14-80.000.

Bostrom, Lars Sture, to Aktiebolaget Robacks Mekaniska. Crushing plant. 245,865, 9-20-77, Cl. D25-3.000.

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Bramlette, Jack C.: *See*—
Donat, Daryl J., 245,844, Cl. D15-4.000.

Bulloch, Andrew C.; and Rolen, Ronald R. Container for solid vaporizer. 245,862, 9-20-77, Cl. D23-150.000.

Burton, Keith O. Combined foldable and transportable home. 245,868, 9-20-77, Cl. D25-30.000.

Carre, Alain, to Waternab S.A. Ball-point pen. 245,852, 9-20-77, Cl. D19-45.000.

Casnovsky, William M.: *See*—
Boldt, Melvin H.; and Casnovsky, William M., 245,842, Cl. D14-80.000.

Catania, Salvatore J.: *See*—
Conti, Sam; and Catania, Salvatore J., 245,816, Cl. D2-380.000.

Conti, Sam; and Catania, Salvatore J. Motorcyclist's safety belt. 245,816, 9-20-77, Cl. D2-380.000.

Corning Glass Works: *See*—
McBurney, William C.; and Strawser, Thomas J., Jr., 245,877, Cl. D59-2.00A.

Cowan, Arnold. Helical spring retracting tool. 245,829, 9-20-77, Cl. D8-16.000.

de Gross, Francois, to Francois de Gross & Cie. Bottle-opener. 245,830, 9-20-77, Cl. D8-18.000.

Deuchar, Robert C.; and Waitzman, Gene J. Wax applicator housing. 245,845, 9-20-77, Cl. D15-48.000.

Deutsche Semperit Gummiwerk Ges. m.b.H.: *See*—
Arendt, Gernot, 245,836, Cl. D12-143.000.
Arendt, Gernot, 245,837, Cl. D12-151.000.

DeWar, William. Fishing lure. 245,853, 9-20-77, Cl. D22-27.000.

Donat, Daryl J., to Bramlette, Jack C., a part interest. Lower unit guard

for marine outboard motor and stern drive. 245,844, 9-20-77, Cl. D15-4.000.
Dougherty, Duayne D. Fence post top. 245,870, 9-20-77, Cl. D25-77.000.
Drechsler, Mark Alan: *See*—
West, Robert F.; and Drechsler, Mark Alan, 245,831, Cl. D8-20.000.
Dystant, Patricia K. Combined clock face and hands therefor. 245,833, 9-20-77, Cl. D10-125.000.
Elder, Robert, to Baker, Joseph. Baby bath seat. 245,861, 9-20-77, Cl. D23-52.000.
Fields, Robert. Table top. 245,823, 9-20-77, Cl. D6-192.000.
Francois de Gross & Cie.: *See*—
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Fredriksson, Lars, to K.A. Bergs Smide AB. Load hook. 245,832, 9-20-77, Cl. D8-367.000.
Gelbart, Rywka Luba. Rolling massage unit. 245,864, 9-20-77, Cl. D24-36.000.
Grube, Clifford E., to Associated Mills, Inc. Showerhead. 245,855, 9-20-77, Cl. D23-35.000.
Grube, Clifford E., to Associated Mills, Inc. Body massage attachment for a handheld showerhead. 245,856, 9-20-77, Cl. D23-35.000.
Grube, Clifford E., to Associated Mills, Inc. Scalp massage attachment for a handheld showerhead. 245,857, 9-20-77, Cl. D23-35.000.
Grube, Clifford E., to Associated Mills, Inc. Handheld showerhead. 245,858, 9-20-77, Cl. D23-35.000.
Grube, Clifford E., to Associated Mills, Inc. Handheld showerhead. 245,859, 9-20-77, Cl. D23-35.000.
Grube, Clifford E., to Associated Mills, Inc. Showerhead. 245,860, 9-20-77, Cl. D23-35.000.
Harty, Millard Fillmore, Jr., to Motor Wheel Corporation. Combined wheel and hub cap. 245,840, 9-20-77, Cl. D12-209.000.
Hawthorne, Allen Dana: *See*—
Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, 245,847, Cl. D16-30.000.
Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, 245,848, Cl. D16-30.000.
Hirasawa, Isamu; Sasai, Minoru; and Ito, Kunio, to Kanda Tsushin Kogyo Co., Ltd. Telephone. 245,843, 9-20-77, Cl. D14-57.000.
Holland, Eliud W. Building. 245,867, 9-20-77, Cl. D25-23.000.
International Business Machines Corporation: *See*—
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Korpi, Reuben F. Hamburg patty press. 245,827, 9-20-77, Cl. D7-43.000.
Lap, Yiu Chung. Combination of high intensity lamp and built-in solid state clock. 245,874, 9-20-77, Cl. D48-20.00D.
Lemke, Joel F.; and Lemke, Mary Lou. Garment coordinating hanger. 245,825, 9-20-77, Cl. D6-256.000.
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Lemke, Joel F.; and Lemke, Mary Lou, 245,825, Cl. D6-256.000.
Livingston, Richard W. Coin operated vacuum. 245,846, 9-20-77, Cl. D15-52.000.
Luce, James W., to Syracuse China Corporation. Dinner plate or similar article. 245,826, 9-20-77, Cl. D7-25.000.
Lusk, Dorinda J.: *See*—
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Lusk, Leon D.; Lusk, Dorinda J.; and Smith, Bobby E. Statuette with hanging string. 245,835, 9-20-77, Cl. D11-131.000.
Malcolm, Donald A., to W. R. Grace & Co. Combined display and carrying case for a drill or the like. 245,880, 9-20-77, Cl. D87-1.00R.
Matthews, Joseph W. Missal stand. 245,820, 9-20-77, Cl. D6-29.000.
McBurney, William C.; and Strawser, Thomas J., Jr., to Corning Glass Works. Decalcomania for culinary ware. 245,877, 9-20-77, Cl. D59-2.00A.
Messinger, Buck D. Motorcycle cab. 245,838, 9-20-77, Cl. D12-156.000.
Monnet, Claude Alain Richard, to Shell International Petroleum Company Limited. Gas burner or similar article. 245,828, 9-20-77, Cl. D7-136.000.
Morrison, David Jon. Soap bar. 245,878, 9-20-77, Cl. D73-1.00A.
Morrison, David Jon. Soap bar. 245,879, 9-20-77, Cl. D73-1.00A.
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Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, 245,848, Cl. D16-30.000.
O'Shea, William J. Wall sconce for votive candle holder. 245,873, 9-20-77, Cl. D48-2.000.
Otani, Akemasa. Sheet pile. 245,869, 9-20-77, Cl. D25-75.000.
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Tillberg, Robert, 245,819, Cl. D6-75.000.
Palka, James J. Door panel. 245,824, 9-20-77, Cl. D6-193.000.
Persson, Bjorn Olof Hjalmar. Belt attachable watertight container. 245,818, 9-20-77, Cl. D2-400.000.
Peter Piper Plastics, Inc.: *See*—
Piper, Peter D.; and Bouldin, Kent W., 245,821, Cl. D6-69.000.
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Piper, Peter D.; and Bouldin, Kent W., to Peter Piper Plastics, Inc. Seat or similar article. 245,822, 9-20-77, Cl. D6-69.000.
Podunavac, Bozo. Guitar head. 245,875, 9-20-77, Cl. D56-1.00A.
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Sasai, Minoru: *See*—
Hirasawa, Isamu; Sasai, Minoru; and Ito, Kunio, 245,843, Cl. D14-57.000.
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McBurney, William C.; and Strawser, Thomas J., Jr., 245,877, Cl. D59-2.00A.
Strickland, Lloyd A. Eyeglasses. 245,849, 9-20-77, Cl. D16-71.000.
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Strickland, Lloyd A. Eyeglasses. 245,851, 9-20-77, Cl. D16-71.000.
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CLASS 71

67	4,049,417
76	4,049,418
	4,049,419
88	4,049,420
90	4,049,421
92	4,049,422
118	4,049,423
	4,049,424

CLASS 72

12	4,048,825
21	4,048,826
50	4,048,827
83	4,048,828
148	4,048,829
175	4,048,830
251	4,048,831
255	4,048,832
290	4,048,833
294	4,048,834
334	4,048,835
364	4,048,836
387	4,048,837
405	4,048,838
412	4,048,839
437	4,048,840
450	4,048,841
455	4,048,842

CLASS 73

1 B	4,048,843
32 R	4,048,844
45.5	4,048,845
67.2	4,048,846
67.5 R	4,048,847
88.5 R	4,048,848
105	4,048,849
133 R	4,048,850
141 A	4,048,851
193 R	4,048,852
194 A	4,048,853
194 VS	4,048,854
299	4,048,855
324	4,048,856
354	4,048,857
486	4,048,858
516 R	4,048,859
556	4,048,860

CLASS 74

56	4,048,861
57	4,048,862
229	4,048,863
230.17 F	4,048,864
231 R	4,048,865
242.1 FP	4,048,866
424.8 B	4,048,867
436	4,048,868
471 R	4,048,869
473 R	4,048,870
687	4,048,871
711	4,048,872

CLASS 75

3	4,049,435
.5 R	4,049,436
10 R	4,049,437
21	4,049,438
24	4,049,439
35	4,049,440
	4,049,441
55	4,049,442
66	4,049,443
82	4,049,444
	4,049,445
124	4,049,430
126 C	4,049,431
128 F	4,049,432
129	4,049,433
134 C	4,049,434
135	4,049,425
153	4,049,426
171	4,049,427
208 R	4,049,428
246	4,049,429

CLASS 81

3 R	4,048,873
57.31	4,048,874
125	4,048,875
165	4,048,876
313	4,048,877
409	4,048,878

CLASS 82

28 R	4,048,879
29 R	4,048,880
31	4,048,881
36 A	4,048,882

CLASS 83

4	4,048,883
24	4,048,884
38	4,048,885
58	4,048,886
79	4,048,887
89	4,048,888
138	4,048,889
146	4,048,890
528	4,048,891
799	4,048,892

CLASS 84

1.01	4,048,893
318	4,048,894
411 A	4,048,895
422 R	4,048,896

CLASS 85

33	4,048,897
77	4,048,898

CLASS 86

39	4,048,899
48	4,048,900

CLASS 89

132	4,048,901

CLASS 90

11 F	4,048,902

CLASS 91

6.5	4,048,903
375 A	4,048,904
405	4,048,905
491	4,048,906
492	4,048,907

CLASS 92

159	4,048,908
194	4,048,909

CLASS 96

1 LY	4,049,446
1 SD	4,049,447
1.5 R	4,049,448
	4,049,449
29 R	4,049,450
36.1	4,049,451
	4,049,452
36.3	4,049,453
55	4,049,454
76 R	4,049,455
84 R	4,049,456
88	4,049,457
100 N	4,049,458
115 R	4,049,459

CLASS 98

2.16	4,048,910
39	4,048,911
115 SB	4,048,912

CLASS 101

27	4,048,913
35	4,048,914
	4,048,915
40	4,048,916
	4,048,917
114	4,048,918
148	4,048,919
	4,048,920
426	4,048,921

CLASS 102

92.7	4,048,922

CLASS 104

21	4,048,923
245	4,048,924

CLASS 105

.5	4,049,033
215 C	4,048,925

CLASS 106

15 R	4,049,460
56	4,049,461
85	4,049,462
288 B	4,049,463
	4,049,464
314	4,049,465

CLASS 109

65	4,048,926

CLASS 110

8 R	4,048,927
165 R	4,048,928

CLASS 111

85	4,048,929

CLASS 112

79 A	4,048,930
121.27	4,048,931
158 E	4,048,932

CLASS 113

1 B	4,048,933
120 F	4,048,935
120 H	4,048,934

CLASS 114

65 R	4,048,936
72	4,048,937
75	4,048,938
125	4,048,939
145 A	4,048,940
248	4,048,941
253	4,048,942
256	4,048,943
293	4,048,944
294	4,048,945
307	4,048,946

CLASS 115

3	4,048,947

CLASS 116

114 PV	4,048,948
124.3	4,048,949

CLASS 118

6	4,048,950
	4,048,951
	4,048,952
49	4,048,953
49.1	4,048,954
49.5	4,048,955
306	4,048,956
653	4,048,957
658	4,048,958

CLASS 119

20	4,048,959
28	4,048,960
96	4,048,961

CLASS 122

20 B	4,048,962

CLASS 123

25 R	4,048,963
32 EA	4,048,965
32 ED	4,048,964
117 A	4,048,966
119 A	4,048,967
	4,048,968
133	4,048,969
139 AJ	4,048,970
139 R	4,048,971
148 D	4,048,972
191 M	4,048,974
191 SP	4,048,973
193 P	4,048,975

CLASS 124

47	4,048,976

CLASS 125

23 R	4,048,977

CLASS 126

200	4,048,978
202	4,048,979
270	4,048,980
271	4,048,981
	4,048,982
	4,048,983
337 R	4,048,984

CLASS 127

29 4,049,466

CLASS 128

2 R 4,048,986
2 S 4,048,985
4 4,048,988
20 4,048,987
55 4,048,989
64 4,048,990
165 4,048,991
184 4,048,992
212 4,048,993
214 F 4,048,994
214 R 4,048,995
4,048,996
215 4,048,997
263 4,048,998
272.1 4,048,999
276 4,049,000
287 4,049,001
318 4,049,002
419 PG 4,049,003
4,049,004

CLASS 131

187 4,049,005

CLASS 132

5 4,049,006
7 4,049,007
33 B 4,049,008
76.4 4,049,009
88.5 4,049,010

CLASS 133

1 A 4,049,011

CLASS 134

2 4,049,467

CLASS 136

225 4,049,469

CLASS 137

3 4,049,012
263 4,049,013
315 4,049,014
496 4,049,015
498 4,049,016
540 4,049,017
561 R 4,049,018
625.11 4,049,020
625.21 4,049,019
625.31 4,049,021

CLASS 138

176 4,049,022

CLASS 139

339 4,049,023

CLASS 140

71.5 4,049,024
102.5 4,049,025
105 4,049,026

CLASS 141

1.1 4,049,027
10 4,049,028
206 4,049,029
284 4,049,031
286 4,049,030

CLASS 144

2 Z 4,049,032

CLASS 148

3 4,049,470
9 R Re.29,408
13 4,049,471
16 4,049,472
16.5 4,049,473
32.5 4,049,474
101 4,049,475
175 4,049,476
187 4,049,477
4,049,478

CLASS 150

8 4,049,034
38 4,049,035
52 K 4,049,036

CLASS 152

427 4,049,037

CLASS 156

71 4,049,479
94 4,049,480
151 4,049,481
172 4,049,482
230 4,049,483
285 4,049,484
351 4,049,485
405 R 4,049,486
436 4,049,487
655 4,049,488

CLASS 160

166 A 4,049,038

CLASS 162

30 R 4,049,489
37 4,049,490
101 4,049,491
146 4,049,492
157 R 4,049,493

CLASS 164

52 4,049,039
120 4,049,040
4,049,041
278 4,049,042
295 4,049,043

CLASS 165

11 4,049,044
12 4,049,045
18 4,049,046
107 4,049,047
159 4,049,048
165 4,049,049
4,049,050
166 4,049,051

CLASS 166

183 4,049,052
249 4,049,053
273 4,049,054
278 4,049,055
299 4,049,056
304 4,049,057

CLASS 171

58 4,049,058

CLASS 172

15 4,049,059
19 4,049,060
49 4,049,061
126 4,049,062
283 4,049,063

CLASS 173

147 4,049,064

CLASS 174

35 C 4,049,902
68.5 4,049,903
107 4,049,904
163 F 4,049,905

CLASS 175

52 4,049,065
323 4,049,066
406 4,049,067

CLASS 177

25 4,049,068
134 4,049,069

CLASS 178

2 C 4,049,906
58 R 4,049,908
67 4,049,909
69.1 4,049,910

CLASS 179

1 GQ 4,049,912
1 H 4,049,911
1 SD 4,049,913
2.5 R 4,049,914
6 C 4,049,915
4,049,916
15 AP 4,049,917
15 BT 4,049,918
18 AB 4,049,922
18 BC 4,049,920
4,049,921
18 FA 4,049,919
18 GE 4,049,923
90 R 4,049,924
99 4,049,925
115 V 4,049,926
150 4,049,927
170 J 4,049,929
170 R 4,049,928
175.1 A 4,049,930

CLASS 180

8 C 4,049,070
24.05 4,049,071
64 M 4,049,072
103 A 4,049,073

CLASS 181

114 4,049,077
120 4,049,078
220 4,049,075
224 4,049,076
286 4,049,074

CLASS 182

2 4,049,079
48 4,049,080
148 4,049,081
217 4,049,082

CLASS 187

9 R 4,049,083

CLASS 188

1 A 4,049,084
18 A 4,049,085
24 Re.29,404
73.3 4,049,086
73.5 4,049,087
107 4,049,088
171 4,049,089
251 M 4,049,090

CLASS 190

18 R 4,049,091

CLASS 191

40 4,049,092

CLASS 192

3.3 4,049,093
3.31 4,049,094
3.51 4,049,095
4 A 4,049,096
8 R 4,049,097
4,049,098
46 4,049,099
58 C 4,049,100
87.19 4,049,101
93 R 4,049,102
105 CD 4,049,103
150 4,049,104

CLASS 193

31 R 4,049,105

CLASS 194

1 B 4,049,106

CLASS 195

1.1 4,049,494
36 R 4,049,495
66 R 4,049,496
80 R 4,049,497
96 4,049,498
100 4,049,499

CLASS 197

1 R 4,049,107
4,049,108
53 4,049,109
4,049,110

CLASS 198

345 4,049,500
445 4,049,111
834 4,049,112

CLASS 200

44 4,049,932
48 R 4,049,933
61.7 4,049,934
83 P 4,049,935
146 R 4,049,936

CLASS 202

239 4,049,501

CLASS 203

10 4,049,502

CLASS 204

1 T 4,049,503
38 A 4,049,504
38 R 4,049,505
4,049,506
39 4,049,507
43 S 4,049,508
49 4,049,509
55 R 4,049,510
67 4,049,511
119 4,049,514
157.1 R 4,049,515
158 HA 4,049,516
159.18 4,049,517
159.21 4,049,518
180 P 4,049,519
186 4,049,520
192 E 4,049,521
192 M 4,049,522
192 R 4,049,523
195 C 4,049,525
195 M 4,049,526
195 S 4,049,524
198 4,049,527
212 4,049,512
243 M 4,049,528
246 4,049,529
273 4,049,530
275 4,049,531
290 F 4,049,513
4,049,532
298 4,049,533
299 R 4,049,534
305 4,049,535

CLASS 206

44 B 4,049,114
44 R 4,049,113
.84 4,049,115
176 4,049,116
270 4,049,117
330 4,049,118
387 4,049,119
396 4,049,120
439 4,049,121
519 4,049,122
611 4,049,190

CLASS 208

10 4,049,536
4,049,537
50 4,049,538
65 4,049,539
127 4,049,540
4,049,541
213 4,049,542
263 4,049,543

CLASS 209

45 4,049,544
74 M 4,049,123
98 4,049,124

CLASS 210

28 4,049,545
30 R 4,049,546
54 4,049,547
96 R 4,049,548
104 4,049,549
152 4,049,550
163 4,049,551
192 4,049,552
195 R 4,049,553
242 S 4,049,554
409 4,049,555

CLASS 211

47 4,049,125
104 4,049,126
189 4,049,127

CLASS 213

1.6 4,049,128
4 4,049,129

CLASS 214

8.5 A 4,049,130
14 4,049,131
4,049,132
17 B 4,049,133
29 4,049,134
38 CC 4,049,135
38 R 4,049,136
82 4,049,137
132 4,049,138
138 R 4,049,139
147 G 4,049,140
152 4,049,141
301 4,049,142
390 4,049,143
519 4,049,145
620 4,049,146

CLASS 215

12 R 4,049,147
214 4,049,148

CLASS 219

7.5 4,049,937
10.55 D 4,049,939
10.55 R 4,049,938
4,049,940
61 4,049,941
69 M 4,049,942
74 4,049,943
121 EM 4,049,944
121 LM 4,049,945
131 R 4,049,946
216 4,049,947
404 4,049,948
521 4,049,949

CLASS 220

1.5 4,049,149
62 4,049,150
201 4,049,151
209 4,049,152
345 4,049,153

CLASS 221

76 4,049,154
192 4,049,155

CLASS 222

54 4,049,156
81 4,049,157
95 4,049,158
144.5 4,049,159
215 4,049,160
233 4,049,161
448 4,049,144
476 4,049,162

CLASS 223

96 4,049,163

CLASS 224

5 E 4,049,165
5 W 4,049,164
42.1 G 4,049,166

CLASS 225

2 4,049,167
94 4,049,171

CLASS 226

40 4,049,168
47 4,049,169
74 4,049,170
90 4,049,172
196 4,049,173

CLASS 227

67 4,049,174
4,049,175
4,049,176
4,049,177
4,049,178
4,049,179
78 4,049,180
113 4,049,181

CLASS 228

2 4,049,182
50 4,049,183
131 4,049,184
155 4,049,185
225 4,049,186

CLASS 229

1.5 B 4,049,187
14 BL 4,049,188
48 R 4,049,189
62.5 4,049,191

CLASS 233

14 R 4,049,192

CLASS 235

61.6 R 4,049,950
92 FP 4,049,951
92 T 4,049,952
150.3 4,049,953
151.32 4,049,954
152 4,049,955
153 AC 4,049,956
153 AK 4,049,957
193 4,049,958

CLASS 236

46 R 4,049,193

CLASS 237

1 A 4,049,194
4,049,195
51 4,049,196

CLASS 239

218.5 4,049,197
265.39 4,049,198
4,049,199
318 Re.29,405
338 4,049,200

CLASS 240

7.55 4,049,959

CLASS 241

5 4,049,201
30 4,049,202
52 4,049,203
55 4,049,204
67 4,049,205
73 4,049,206
101.7 4,049,207

CLASS 242

7.05 B 4,049,208
18 PW 4,049,209
18 R 4,049,210
45 4,049,211
56.9 4,049,212
57.1 4,049,213
75.51 4,049,214
125.1 4,049,215
192 4,049,216
213 4,049,217

CLASS 244

23 C 4,049,218
53 R 4,049,220
118 R 4,049,221
137 R 4,049,222
180 4,049,223
217 4,049,219

CLASS 245

6 4,049,224

CLASS 248

219.4 4,049,225
248 4,049,226
309 R 4,049,227
480 4,049,228
503 4,049,229
539 4,049,230

CLASS 249

64 4,049,231

CLASS 250

201 4,049,960
202 4,049,961
4,049,962
211 R 4,049,963
221 4,049,964
233 4,049,644
237 G 4,049,965
369 4,049,966
445 T 4,049,967
4,049,968
458 4,049,969
461 B 4,049,970
531 4,049,707

CLASS 251

30 4,049,232
61.1 4,049,233
149.9 4,049,234
297 4,049,235

CLASS 252

3 4,049,556
8.55 D 4,049,559
8.8 4,049,557
8.9 4,049,558
33.3 4,049,560
46.7 4,049,561
4,049,562
49.9 4,049,563
51.5 A 4,049,564
4,049,565
62.54 4,049,566
300 4,049,567
301.19 4,049,568
372 4,049,569
373 4,049,570
430 4,049,571
431 N 4,049,572
432 4,049,573
437 4,049,574
439 4,049,575
441 4,049,576
443 4,049,577
455 R 4,049,578
4,049,579
466 J 4,049,580
466 PT 4,049,581
4,049,582
4,049,583
470 4,049,584
531 4,049,585
532 4,049,586

CLASS 254

28 4,049,236
106 4,049,237
139.1 4,049,238
172 4,049,239

CLASS 259

3 4,049,240
4 AC 4,049,241
72 4,049,242
122 4,049,243
185 4,049,244
191 4,049,245

CLASS 260

2.3 4,049,588
2.5 AC 4,049,591
4,049,931
2.5 AD 4,049,592
2.5 B 4,049,594
2.5 BE 4,049,590
2.5 E 4,049,593
2.5 HB 4,049,622
2.5 L 4,049,587
2.5 M 4,049,589
5 4,049,595
18 EP 4,049,596
4,049,597
18 N 4,049,598
22 EP 4,049,600
22 M 4,049,599
24 4,049,601
27 R 4,049,602
28.5 R 4,049,603
29.4 UA 4,049,606
4,049,607
29.6 AN 4,049,605
29.6 NR 4,049,609
29.6 RW 4,049,604
29.6 SQ 4,049,608
31.2 N 4,049,610
31.6 4,049,611
31.8 R 4,049,612
37 N 4,049,613

37 PC 4,049,614
39 P 4,049,615
40 4,049,621
42.32 4,049,616
45.75 B 4,049,619
45.75 P 4,049,618
45.75 R 4,049,620
45.8 R 4,049,617
45.95 G 4,049,623
4,049,624
4,049,625
4,049,626
4,049,627
47 C 4,049,629
47 R 4,049,630
47 UA 4,049,628
75 NE 4,049,632
75 R 4,049,635
75 S 4,049,631
75 T 4,049,633
75 UA 4,049,634
77.5 CR 4,049,636
78 L 4,049,638
78 TF 4,049,637
140 4,049,639
175 4,049,640
191 4,049,641
196 4,049,642
207.1 4,049,643
239 B 4,049,645
239.3 A 4,049,646
256.4 N 4,049,661
256.5 R 4,049,656
268 PC 4,049,658
4,049,660
268 SY 4,049,657
268 TR 4,049,659
287 D 4,049,662
293.86 4,049,663
294.8 C 4,049,664
294.8 J 4,049,665
294.8 R 4,049,666
4,049,667
295 R 4,049,668
306.8 D 4,049,670
306.8 R 4,049,669
314 4,049,673
332.1 4,049,674
4,049,675
4,049,676
340.9 AS 4,049,677
343.41 4,049,678
402.5 4,049,679
404.5 4,049,680
408 4,049,681
410 4,049,682
410.7 4,049,683
412 4,049,684
412.5 4,049,685
424 4,049,686
428 4,049,687
4,049,688
429.7 4,049,689
448.2 B 4,049,692
448.2 E 4,049,690
448.2 N 4,049,691
465 F 4,049,693
4,049,696
465 G 4,049,694
4,049,695
501.12 4,049,702
503 4,049,703
507 R 4,049,704
512 C 4,049,705
514 H 4,049,706
534 C 4,049,708
543 R 4,049,709
544 C 4,049,710
551 C 4,049,711
554 4,049,712
559 R 4,049,713
564 R 4,049,714
571 4,049,715
573 4,049,716
575 4,049,717
590 C 4,049,718
606.5 P 4,049,719
610 B 4,049,720
619 A 4,049,721
619 R 4,049,722
621 A 4,049,723
635 H 4,049,724
638 B 4,049,725
649 R 4,049,726
650 R 4,049,727
653.6 4,049,728
654 H 4,049,729
663 4,049,730
666.5 4,049,731
668 B 4,049,732
668 C 4,049,733
668 R 4,049,734
4,049,735
669 QZ 4,049,736
671 M 4,049,738
671 P 4,049,737
671 R 4,049,739
4,049,740
676 R 4,049,741
681.5 R 4,049,742
4,049,743
837 R 4,049,744
4,049,745
851 4,049,746
859 PV 4,049,747
861 4,049,748
862 4,049,749
864 4,049,750
876 R 4,049,751
878 R 4,049,752
880 B 4,049,753
952 4,049,754
987 4,049,755

CLASS 261

62 4,049,758

CLASS 264

1 4,049,756
22 4,049,757
30 4,049,759
45.5 4,049,768
51 4,049,760
89 4,049,761
94 4,049,762
176 F 4,049,763
178 F 4,049,764
210 F 4,049,766
257 4,049,767
261 4,049,765

CLASS 266

158 4,049,246
182 4,049,247
202 4,049,248
247 4,049,249
275 4,049,250

CLASS 267

64 R 4,049,251

CLASS 269

57 4,049,252
137 4,049,253
156 4,049,254

CLASS 271

3 4,049,255
9 4,049,256
114 4,049,257
151 4,049,258
4,049,259
4,049,260
269 4,049,261

CLASS 272

1 R 4,049,262
66 4,049,263
74 4,049,264

CLASS 273

1 R 4,049,265
29 A 4,049,266
55 B 4,049,267
73 A 4,049,268
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756 4,049,294

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219 4,050,085

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94	4,049,882	193	4,049,468	265	4,049,373			21	4,049,651		4,049,700
	4,049,883		4,049,891	CLASS 526		17	4,049,898	54	4,049,652	118	4,049,697
104	4,049,884	194	4,049,892	26	4,049,893			150	4,049,653	127	4,049,698
	4,049,885									130	4,049,701

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D2—	29	245,817		43	245,827		156	245,838			245,848			245,859	
	380	245,816		136	245,828		176	245,839		71	245,849			245,860	D34— 14 B 245,872
	400	245,818	D8—	16	245,829		209	245,840			245,850		52	245,861	D48— 2 245,873
D6—	29	245,820		18	245,830	D14—	57	245,843			245,851		150	245,862	20 D 245,874
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	256	245,825	D12—	143	245,836		52	245,846			245,857		30	245,868	245,879
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4,049,326	4,049,421	9 : 4,048,783	4,048,755	4,049,688	4,049,332
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4,048,724	4,049,561	4,049,196	4,048,907	4,049,934	4,049,013
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DESIGN PATENTS

2	:	245,834	9	:	245,831		245,855	26	:	245,833		245,863		245,822
4	:	245,870			245,847		245,856			245,840		245,864		245,862
6	:	245,817			245,848		245,857	29	:	245,854		245,873	51	: 245,839
		245,825	12	:	245,820		245,858	31	:	245,816	37	: 245,835		245,849
		245,829			245,867		245,859			245,878	42	: 245,877		245,850
		245,845	17	:	245,823		245,860			245,879		245,880		245,851
		245,853			245,824	18	: 245,868							
		245,861			245,841	19	: 245,838	33	:	245,827	46	: 245,876	53	: 245,844
		245,875			245,842	24	: 245,846	36	:	245,826	48	: 245,821		245,871

PLANT PATENTS

6 : 4,106	4,107	4,108	4,109	4,110	

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U.S. DEPARTMENT OF COMMERCE
Juanita M. Kreps, Secretary

PATENT AND TRADEMARK OFFICE
Lutrelle F. Parker, Acting Commissioner